THE APPLICATION OF COLLABORATIVE PLANNING PRINCIPLES WITH A CONTENT MANAGEMENT SYSTEM AND WEB 2.0 TECHNOLOGIES

A Thesis submitted in partial fulfillment of the requirements for the degree of Master in Urban and Regional Planning at Virginia Commonwealth University.

by

CRAIG MACIVOR
B.A., Furman University, 2005
M.U.R.P., Virginia Commonwealth University, 2010

Director: DR. IVAN SUEN
MASTER OF URBAN AND REGIONAL PLANNING PROGRAM
L. DOUGLAS WILDER SCHOOL OF GOVERNMENT AND PUBLIC AFFAIRS

Virginia Commonwealth University
Richmond, Virginia
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Abstract

THE APPLICATION OF COLLABORATIVE PLANNING PRINCIPLES WITH A CONTENT MANAGEMENT SYSTEM AND WEB 2.0 TECHNOLOGIES

By Craig MacIvor, M.U.R.P

A Thesis submitted in partial fulfillment of the requirements for the degree of Master in Urban and Regional Planning at Virginia Commonwealth University.

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Major Director: Dr. Ivan Suen
Director, Master of Urban and Regional Planning Program

As urban planners have sought to move away from the rationalist approach that has been employed for decades, and to encourage more public participation than has traditionally existed in the planning process, they have consistently encountered obstacles in successfully communicating with other stakeholders. Likewise, many citizens do not feel they have enough access to planning-related information or adequate means of participation. These systemic problems are due in large part to the limitations of the media on which planning documents have always been printed; the structure and content of the paper-based comprehensive plan has meant that the rationalist process has, at least until recently, been planners' only feasible option for conveying information to the public.

However, the ubiquity of the Internet and the development of structured wikis and content management systems have arguably overcome this barrier, as these tools offer the communication power that planners have long needed. The purpose of this thesis is to research these collaborative technologies, study their functionality and practical feasibility, and propose that they be implemented as an alternative approach to a document and decision making model that is rapidly becoming obsolete. This document was created with Microsoft Word 2007.

Introduction

In recent years, planning professionals and theorists have sought to devise new planning models better suited to the democratic process. Their concerted efforts have led to more inclusive elements in that process, but most planners remain limited to traditional town-hall style public meetings where participation is limited to those present at the meeting. The purpose of this thesis is to propose the use of a new outreach methodology, appropriate to a society that has changed significantly under the influence of rapidly advancing communications technology.

Although these technological advances have been occurring for decades, the social, political, and economic effects of these changes have only recently become apparent. Networked computers have been used for decades in the defense sector, in academia, and in the corporate world for information storage, processing, and sharing. In more recent years the development of web-based software revolved around commercial activity, such as that of eBay or Craigslist. Even more recently, information-sharing and social software for personal use such as Facebook and Wikipedia have grown to the point of ubiquity. Labor productivity increases in recent years have largely been driven by technology, particularly information networks that allow companies to scatter their offices around the globe. Information has meanwhile become more readily accessible, rendering greater transparency and giving consumers more power in their decision-making.

Problem Definition

Despite the recent advances in communications technology, government has generally been slow thus far to adopt new technology. Although there has been much hype about so-called "e-government", most governments remain behind in granting citizens access to knowledge or participation in policy-making. Many local governments have developed GIS websites displaying property information, but there has otherwise been little application of social software in the planning field. Some planners have employed new visualization and 3D modeling techniques, and have experimented with electronic town meetings (Macris, 24), but have found it difficult to venture far beyond the rationalist structures that have dominated the planning profession since its inception.

Research Context

Although there is a wide body of research into how technology can improve urban planning methodology, most studies have focused on the use of Geographic Information Systems (GIS) and so-called "Planning Support Systems", or PSS. A GIS is usually a mapping technology that can display, store, manage, and analyze an abstraction of geographic features in either 2D or 3D form. A PSS, which is usually defined as a type of Decision Support System or DSS, typically are desktop applications that assist a planner in conducting analysis. The research on these systems will be discussed in more detail later, but it is important to note that this thesis does not seek to build on the research conducted towards these systems.

Instead, this thesis will argue that a PSS does not necessarily have to be only a GIS or DSS; the focus here will be on so called "Information Systems" in general, and what form such a system would take that would make it useful in a modern urban planning context. In this case, we will define a modern urban planning context as specifically a *collaborative* planning context, as opposed to one that is *rational* in nature. A wide body of research exists on the differences between collaborative and rational planning, a small sample of which will be discussed in a later chapter. Another wide body of research also exists on the GIS and PSS/DSS systems mentioned here, and these will be discussed in the same chapter. The terminology used here thus far will also be defined and clarified.

Research Objectives

The purpose of this thesis is twofold. First, after demonstrating that collaborative planning is the future of urban planning in general, the author wishes to discover what typical urban planners would want an information system to do, and how they would use it in a collaborative planning process. Second, criteria will then be defined that will outline what web based technology should do in order to be relevant to collaborative planning. These criteria will then be used for a comparative analysis of several popular content management system software packages. One of these software packages will then be chosen as a potential engine for an online collaborative planning process, and will be customized and configured in a tutorial that discusses how it could be integrated into the process.

Literature Review

The Legal Basis for Web-Based Collaborative Planning

Since the 1920's, the planning process has been largely defined by the requirements laid out in the Department of Commerce's models for the Standard City Planning Enabling and Zoning Acts, which were intended as model legislation for land use controls at the local level. Although some states and localities have reached beyond this model for new methods, the Acts remain an important influence in how communities develop (Mandelker 3.05). This influence includes the structure and content of the Comprehensive Plan, as well as the process by which the Plan is formulated and adopted, namely by the Planning Commission and its support staff. Unfortunately, the provision for meaningful public participation in the typical enabling legislation is limited.

Virginia state law allows for a wide variety of elements in the Comprehensive Plan, specifying that "it may include, but need not be limited to" environmental protection measures, designation of historical and urban renewal areas, designation of routes for electricity transmission, and other typical planning issues. (Virginia General Assembly Legislative Information System ,15.2-2223). While the planning commission is required to hold a public hearing prior to recommendation to the governing body, there is little said specifically about how hearings are to be conducted. There are guidelines on how notices are to be advertised, but it is notable that the code only specifies publication of advertisements in newspapers (Virginia General Assembly Legislative Information

System, 15.2-2204). Paper newspapers' declining circulation means that this prescription for public notice is inadequate. However, the code's vague language possibly does leave room for localities' experimentation with new public outreach methods.

Extent of Technology Usage in Planning Departments

In contrast to the widespread use of collaborative web-based project management software in the private sector, local planning agencies have been slow to adopt the technology. While the large majority of planners have access to desktop computers and use GIS, usage of the internet in particular to disseminate information and invite interaction with the public is very limited. This reluctance to adopt the technology persists in spite of widespread efforts to integrate GIS with established community participation strategies, such as the Richmond Neighborhood Indicators Project. In this role, technology was used as a decision-support tool, but was not used to directly boost levels of public participation. In fact, many examples of such Planning Support Systems (PSS) have been employed over the years, as documented by Stan Geertman and John Stillwell. As defined by these authors, PSS can consist of systems in which technologies dedicated to the planning profession are brought together " (Geertman, 2003, 292). Of those documented, the majority were designed for tasks such as forecasting future growth, developing future scenarios based on different policy choices, and other models; these do not have any public participation component. Others, such as the Dutch SketchGIS program, offer tools to facilitate brainstorming sessions, as participants can electronically sketch potential or desirable futures for their community on a web-based background map.

PSS such SketchGIS tend to remain more the exception rather than the rule however, as they are mostly custom programs, or they are proprietary software packages beyond the reach of most citizens' or planning departments' budgets. The reality is that while most planning departments use websites to display ordinances, contact information, and meeting agendas, relatively few use the Web to invite direct participation (Simpson 2004). Only one third of respondents to one survey indicated that they provide a feedback form on their website, or employ an email listserv, and much smaller percentages responded "yes" when asked if they use live broadcasts, online surveys, chat rooms, discussion forums, and other communications tools that are commonly used on the Internet. Furthermore, only half display a copy of their comprehensive plan, and only 28.7% provide a web GIS mapping application.

While this dearth of technology usage can at least be partially explained by politics, it may also be that the technology itself is at least partially to blame. The steep learning curve that often accompanies the adoption of new technology may prove to be a barrier, or the expense associated with hiring consultants is too high for most planning departments. The challenge then is to discern the specific reasons why technology has not been more widely used, so that criteria for designing planning participation technology can be established.

Obstacles to technology adoption in planning

Despite the steady development of various planning-related technologies, and the gradual acceptance of GIS as a key planning support aid, most planners have not used other planning support systems that are available to them. The lack of usage has been well documented, but the reasons for the deficiency are less clear. Some research has shown that a mismatch exists between planners' demand for planning support tools and the current supply of tools that are currently available. In a comparative evaluation of planning support systems, researchers found that most systems available are technically complex, and are designed to support complex problem exploration, analysis, and decision making (Geertman 2007, 6). In contrast practicing planners tend to favor and use systems that combine information storage, retrieval, and communication with simple analysis and visualization. The resistance to more complex instruments partly stems from planners' belief that a computer's precision is of little use in the ambiguous, uncertain nature of the political decision-making process. Planners also dislike the "black box" nature of these systems, in a field where transparency is important. In any case planners indicate little awareness of PSS systems' existence, and even when they are knowledgeable of them, planners reject the systems almost immediately. (Geertman, 2005, 919-920).

Despite this resistance planners' skepticism of analysis and modeling-focused PSS does not extend to the utility of PSS in general. On the contrary, many planners do see potential for web-based consultation systems that encourage more interaction with the public: As researchers Guido Vonk, Stan Geertman, and Paul Schot note,

Users also see PSS as useful for citizens and professional stakeholders if participation increases. Many organizations are already experimenting with intensified consultation in their planning processes. A new range of systems that support this could be useful in such processes, enabling citizens and stakeholders to carry out their own exploration and analysis tasks, while such systems would give them better informed views in the consultation process…the web based systems are now mostly used for dissemination of of planning results, but two-way communication could become very useful in enabling real consultation. Such systems are seen as useful since they will provide lots of different views on which to base designs. The meeting-support systems are now used in their simplest forms- a smart board- by two organizations. Users see such systems as particularly useful if many information functions are integrated."(Geertman, 2007, 1705-1706).

Such systems would allow stakeholders to carry out their own analysis, allowing them to make better-informed decisions. They could then use the PSS to give feedback to planners in ways that were not possible before. Unfortunately, most PSS systems are not designed to do this, because most PSS developers are more focused on developing advanced instruments that attempt to rationalize political decision-making. This mismatch between the needs of the planning community and PSS developers' products are largely responsible for the sparse deployment of PSS in planning practice.

Recommendations for the Design and Use of Planning Support Systems

Following their documentation and analysis of various examples of PSS software, researchers Guido Vonk, Stan Geertman, and Paul Schot note that PSS are "far from being standardized software instruments, widely used in planning practice", and make note of the mismatch between the systems that have been developed and what planners would actually want to use. They then "recommend that [developers] develop their instruments within the niches that professional planners see as the most promising, and go step by step in further

development to make sure that the developed systems appeal to planners instead of to only researchers" (Geertman, 2007, 1711-1712). They surmise that if PSS developers communicate more effectively with planners about what planners want in a PSS, then the "bottlenecks" discovered by the same authors can be overcome.

Stan Geertman and John Stillwell also provide a set of recommendations at the end of their article, *Planning support systems: an inventory of current practice*. Roughly summarized, they are the following:

1. PSS should be an integral part of the planning process and context.
2. PSS should meet use and context requirements, in addition to the requirements of the planning process and context.
3. PSS should approach planning in an interdisciplinary manner, in recognition of the fact that people address issues from an interdisciplinary perspective.
4. PSS should take seriously its users and leave them with the feeling that they have been taken seriously.
5. The user-interface of the PSS should be sensitive to the characteristics of the user, to the kind of information that it communicates to that user, and to the types of intended use that is made of the information provided.
6. The PSS should be focused in particular on the planning problem at hand.
7. PSS should be appealing; they should fulfill participants' needs and wishes, and allow the participants to enjoy using them too.

Although these recommended principles are general in nature, they can be used to form the basis for defining more specific requirements about the features and characteristics that a PSS should contain.

Overview of the Current Planning Framework

For much of the previous century, planning practice has been dominated by what theorists have referred to as "rationalist" planning. As defined by Edward C. Banfield in 1955, rationalist planning basically consists of the following principles:

> 1. the decision-maker considers all of the alternatives (courses of action) open to him...;
> 2. he identifies and evaluates all of the consequences which would follow from the adoption of each alternative....; and
> 3. he selects the alternative, the probable consequences of which would be preferable in terms of his most valued ends (Banfield, 314).

Because they were influenced by a culture that valued scientific reason as the best possible means to achieve desired outcomes, planners attempted to apply these principles for much of the first half of the twentieth century. They saw themselves as applied social scientists, and sought to reshape their communities through the use of ideas borrowed from classical economic theory and the scientific method. Believing that outcomes and consequences of policy decisions could always be correctly predicted, they also discounted

the value of public input, as they believed that the inherently irrational nature of the political process would lead to undesirable results.

In recent years, rationalism has come under increasing criticism from planning theorists, and academia has tended to emphasize the importance of "collaborative" planning. Unfortunately for collaborative planning's advocates, this paradigm shift largely remains confined to the classroom, as real-world practitioners believed they had no choice but to continue employing elements of the rationalist model. As Michael P. Brooks contends, "pragmatic" rationality "is simply the form of reasoning that we employ in the real world as we apply foresight and intelligence in our attempts to solve our problems or shape our future." (Brooks, 82). Planners continue to approach their work in this manner because it seems to be the only realistic approach; the elements of a typical planning process, as defined by Barbara Becker's planning textbook Community Planning, consists of data gathering, data analysis, policy making, and implementation (Becker, 18). The author of this textbook even asserts that "the first two elements of planning- data gathering and data analysis- are essentially objective and rational" (Becker, 18).

Collaborative, Dynamic Planning: A New Approach

Despite the inescapably rationalist emphasis in their field, planners have in recent years responded to public demand for influence by altering the existing framework. Seeking to make planning more inclusive and participatory, planners have increasingly made efforts to organize town hall-style meetings, charettes, conduct surveys and

presentations, and generally involve the public more than was common in past decades. To this end, the American Planning Association published the Charette Handbook in an attempt to outline possible public outreach strategies, and suggests the following principles:

- Usually more, but no less than four consecutive days
- An open process that includes all interested parties
- A collaborative process involving all disciplines in a series of short feedback loops
- A process that produces a feasible plan
- A generalist, holistic approach

This philosophy strongly contrasts with the rationalism described in Community Planning, and is a genuine effort to construct a truly collaborative planning process. Unlike rationalism, it calls for public engagement and review of every step, with what Bill Lennertz and Aarin Lutzenhiser call "dynamic" planning:

In a dynamic planning process, each individual's unique contribution is valued for its potential to help the project become better...True collaboration requires that participants are asked for their input *before* the design work begins to let them know that their contributions will have an impact on the outcome. When people are involved early in the design and creation of a plan they will support the results (Lennertz, 7).

As the authors describe, all phases of dynamic planning including preliminary research, education, preparation, and implementation involve close consultation with the public. The authors list community health, collaboration, transparency, shared learning, and direct, honest communication as dynamic planning values. They then suggest strategies based on these values, including:

- Working collaboratively
- Design Cross-functionality
- Compress Work Sessions
- Communicate in Short Feedback Loops
- Study the Details and the Whole
- Confirm Progress Through Measuring Outcomes
- Produce a Feasible Plan
- Use Design to Achieve a Shared Vision and Create Holistic Solutions
- Conduct a Multiple-day Charette
- Hold the Charette on or Near the Site

This style approach is steadily becoming more popular in planning circles, and has been increasingly integrated with the process. Despite this, the framework within which planners are trying to apply these principles remains essentially rational.

Methodology

Problems with current efforts at planning support systems

The problems with the rationalist model have been widely documented, but they unfortunately persist despite planners' best efforts to emphasize a more collaborative approach (Baum, 1996). Unfortunately, rationalism still influences even many collaborative planning scenarios where public outreach is either too expensive or too time-consuming. With limited resources for soliciting public input available to public planners, private planning consultants, and developers alike, even a collaborative planning process cannot escape its rationalist chains unless new tools are utilized to refocus the scope and scale of the planning process.

As Stan Geertman and John Stillwell have demonstrated, little effort has been devoted toward the development of a PSS geared toward collecting public opinion, as opposed to the analysis and display of GIS data. The vast majority of existing PSS software systems are in fact based on rationalist ideas, with little attention paid to the new emphasis on collaborative planning where public participation is the central characteristic of community development. An urban planning-focused information system should therefore be designed around the ability to collect and store citizen input.

Criteria for a Collaborative Planning Support System

The challenge then is to find a technology toolkit that can be used as a planning information system, with the goal of improving the planning process to be more fundamentally efficient and collaborative in nature and the Internet as the vehicle by which participants, stakeholders, and leaders can interact. The goal here is not necessarily to reform collaborative planning methods, but to effectively apply them with an online toolset. To this end, a sample of popular Web 2.0 collaboration and development tools will be compiled and evaluated for suitability in a collaborative planning process, based on how their functionality can be applied to the workflows typical to collaborative land use decision making.

Building on the research conducted by Stan Geertman and John Stillwell, a set of criteria that a Collaborative Planning Support System (CPSS) should meet will be defined. The sample of web collaboration tools will be tested against these criteria, and a software program meeting them would form the basis and engine of a new, Internet-enabled planning process.

General Minimum Requirements:

1. *The CPSS should be open-source and off-the-shelf, and supported by a large developer community.* At a time when most localities are facing severe tax revenue shortfalls, a low-cost or free toolkit should be considered as the most viable option. Although open source software lacks the support of proprietary products, open

source software can be customized, modified, and extended as needed. Such flexibility is imperative, as each planning process is unique and will thus require a unique approach. However, the software must be developed and maintained by a large developer team or entity with the resources to maintain the project.

Additionally, the CPSS software should be available off the shelf and immediately deployable out of the box. Currently, CPSS systems such as the aforementioned SketchGIS, or the New Jersey Growth Allocation Model, are not viable because they are custom solutions geared for specific geographic areas. A rich, full-featured CPSS on the other hand should be adapted for any geographic region, and for virtually any type of collaborative planning process.

2. *The CPSS's key features should be oriented towards communication and participatory/collaborative planning.* As the literature of current Planning Support Systems shows, the majority of PSS software is oriented toward modeling and analysis by skilled planners and GIS analysts. Even though programs like *CommunityViz* and *What If?* feature tools to display analysis results on the Internet, they do not allow for end-user input, and can only serve as one component of an online collaborative planning process. A complete CPSS would have the ability to display analysis results while allowing for public comment on those analysis results. More broadly stated, a complete CPSS will have the tools to conduct an entire planning process online from start to finish, while restructuring that process around the tools that the program has to offer.

3. *The CPSS software must be sufficiently versatile, customizable, and modular to be adapted to a wide variety of planning scenarios.* Although there is a huge volume of CMS software available, most of them will be ill-suited for planning due to the lack of extensions that can be added to their default features. If the CMS does not have a significant library of stable extensions, it should be excluded as a potential candidate for adaptation as a CPSS. Versatility is crucial if a particular CMS software program is to be applied as a general purpose CPSS platform.

4. *The CPSS should be aesthetically appealing and user friendly.* As Geertman and Stillwell pointed out, a PSS would only be useful if it takes its user seriously, and if it is appealing to use as it fulfills participants' needs and wishes. Although this is a mostly subjective metric to compare various CMS programs, those that feature an attractive interface and an elegant, simple overall design will be favored. Hopefully, a system that meets these goals would be more successful in attracting a greater number and variety of users.

Specific Tool Requirements

In order to meet the general requirements above, the CMS software should contain a variety of dialogue and visualization tools. This toolset should include but is not necessarily limited to the following:

- **Wiki**- a series of interlinked web pages that allow the easy creation and editing of content by any user who has permission. Wikipedia is the one of the most commonly used Wikis. New pages can be created simply by creating a hyperlink and clicking on it. The best example of this can be found at http://www.wikipedia.org/
- **Forum**- Also known as a message board, a forum is simply an online discussion site. An administrator can begin discussion with a first post, and respondents' posts create a "thread". A good example of a forum can be found at http://tikiwiki.org/tiki-forums.php
- **Blog**- Short for "web log", a blog is a type of website that allows its owner to post regular entries of text, graphics, or video. Entries are typically shown in reverse chronological order, and blogs can sometimes allow readers to comment on individual blog posts. Examples abount, but a good example can be found at http://www.soccerbyives.net/
- **Image Gallery**- Common on many websites, an image gallery is a way to display a large number of pictures, often in sequence. The most widely-used image gallery application is http://www.flickr.com/

- **GIS map server**- A web based platform for publishing spatial data on interactive maps. A nice example is Goochland County, Virginia: http://www.co.goochland.va.us/Departments/DepartmentsGZ/GIS/GISDisclaimer/tabid/191/Default.aspx
- **3D visualization capability**- the ability of webpage to display graphics in three dimensions, such as a model of a building. Google Earth remains one of the best ways to implement this. More can be learned about it at http://code.google.com/apis/earth/
- **File storage**- the ability of a website to store files for users to download. Any FTP site has traditionally been one way to do this. The Richmond, Virginia GIS FTP site is one example: ftp://ftp.ci.richmond.va.us/GIS
- **User/Group Management (Permissions)**- The wiki's pages should allow the administrator to set varying levels of viewing and editing permission to various users and groups of users.
- **Survey/Quiz/Polling**- Online surveys and polls are tools for gauging participants' reaction to a project proposal or other idea. The most popular survey creation tool can be found at http://www.surveymonkey.com/
- **Calender/Event Management System** - a tool for scheduling events and recording their associated information. Google Calendar is the most popular calendar application.
- **RSS Syndication**- Really Simple Syndication enables a user to aggregate updates from blog entries and other web content formats. It is used by an

application that connects to the feed. An example is Google Reader, found at http://www.google.com/reader/view/#welcome-page

- **WYSIWYG** Editing- What You See Is What You Get editing allows a user to contribute content without the use of HTML.
- **Sketching tool** for mental mapping and map markup- A whiteboard-style tool for sketching out ideas and development areas on blank spaces and GIS overlays. A good example can be seen at http://www.scriblink.com/
- **Version Control** of documents, which the ability to revert back to previous versions of content posted.

The listed tools are essential features of developing Web 2.0 portals today. They have allowed the Internet to become more interactive, and could potentially serve the same role in urban planning. The challenge is to find them in a free, open source, well designed and integrated software package that can be easily adapted to any planning area and for any decision-making process.

Software Package Evaluation

There is a vast body of CMS/Groupware technology on the web, however only a small number of which will be presented and evaluated here. Basically, the following programs were selected for analysis based on their degree of compliance with the General Requirements outlined in the previous section. Programs not meeting these basic specifications were automatically excluded from consideration. Although there may be other software packages available that could serve as a CPSS, the following examples appear to be the most promising candidates for meeting the stated goals. Each program is summarized with an evaluation of its default features and extensions, and compared with the list of Specific Tool Requirements.

1. **Tikiwiki:** Billed as a "full-featured, open source, multilingual, all-in-one Wiki+CMS+Groupware", Tiki is easily the most promising software programs that could be used as CPSS. Its 220 developers claim it can be used to create web applications, sites, portals, knowledge bases, intranets, and extranets. Once installed, a web-based interface can be used to install a wide variety of modules and extensions. All of the Tool Requirements are met through either of these two sources, with the exception of 3D visualization. This however can be overcome with the use of the HTML plugin, and Google Earth embedded in the HTML. Tikiwiki and its various features come as a complete package, and installation on the test Fedora server resulted in an application that was relatively easy to modify and configure. Although the learning curve for feature and permissions administration is fairly steep for the non-

technical user, the documentation is much more clear and comprehensive than those for the other CMS packages listed below. More information about Tikiwiki can be found at http://info.tikiwiki.org/tiki-index.php.

2. **Joomla:** One of the most popular CMS packages, Joomla is supported by a sponsorship program and has served as the engine behind a number of major corporate websites. It is however, geared more for website creation than a true "Groupware" program like Tikiwiki, and is far more reliant on separate extensions. In practice, this would mean that it offers more flexibility in website design, but will take a greater degree of expertise to set up and configure; its lack of readiness for a planning process became apparent upon installation, as the basic version was very bare. Additionally, many of the third-party extensions are not open-source and must be purchased. Despite this limitation, Joomla's extension library does meet all of the Tool Requirements, except for a native drawing tool for map markup or mental mapping. It can however accommodate the Google Earth API for 3D modeling. More information about Joomla can be found at http://www.joomla.org/.

3. **Drupal:** According to its website, this CMS is "equipped with a powerful blend of features" and "supports a variety of websites ranging from personal weblogs to large community-driven websites." Its general features include a "collaborative book", which allows multiple authors to contribute content (this feature appears to serve the same purpose as a wiki), as well as User Permissions, Polls, Version Control, Blogs,

and Forums. Drupal also has a large collection of community-contributed modules that can be used to extend the basic installation, but most of these are targeted to web developers. Like Joomla, Drupal is more of a web portal development engine, rather than a polished application that could be deployed out of the box. Installation of a copy on the test Fedora server produced only a basic website that would need weeks of development work to be useful in a collaborative planning process. More information about Drupal can be found at http://drupal.org/.

4. **Plone:** The Plone Foundation claims that its software is among the top 2% of all open-source projects worldwide, and that it allows "non-technical people to create and maintain information for a public website or an intranet using only a web browser". While it does offer virtually all of the features that Tikiwiki does, many of those features can only be implemented via extensions that must be downloaded separately. Once installed, the basic package does allow for relatively easy customization with extensions, if they are available from the administration panel. However, Plone must be manually configured to access the extensions before they can become part of the application. The lack of rapid customization means that while Plone is a potentially very useful website development toolkit, it is unsuitable for use as CPSS. More information about Plone can be found at http://plone.org/.

Criteria Summary

Tools	Tikiwiki	Joomla	Drupal	Plone
Wiki	Yes	Yes	Yes	Yes
Forum	Yes	Yes	Yes	Yes
Blog	Yes	Yes	Yes	Yes
Image Gallery	Yes	Yes	Yes	Yes
GIS map server	Yes	No	No	Yes
3D Visualization	Yes	Yes	Yes	Yes
File Storage	Yes	Yes	No	Yes
User Management/Permissions	Yes	Yes	Yes	Yes
Survey/Quiz/Polling	Yes	Yes	Yes	Yes
Calender/Event Management	Yes	Yes	Yes	Yes
RSS Syndication	Yes	Yes	Yes	Yes
WYSIWYG Editing	Yes	Yes	Yes	Yes
Sketching	No	No	No	No
Version Control	Yes	Yes	Yes	Yes
Ready Out of the box?	Yes	No	No	No

Findings

Of the selected software packages discussed here, Tikiwiki has the most potential to serve as a CPSS. It is the only package of those evaluated that is ready to be used upon installation, and requires only minimal configuration to get started. Unlike the other CMS packages, it does not require any modification of its CSS rules or HTML to change its appearance. Further, its features can be installed, uninstalled, and managed via a standard graphical user interface that is challenging but not inaccessible for the non-technical administrator. Installation, maintenance, and backup could be handled by a hosting service, freeing the administrator to focus on using Tikiwiki's numerous tools for various stages of the planning process.

Comparison of Document Structures

Although the differences may seem obvious, it is worth examining how on online Wiki-based, CMS-driven planning portal truly differs from a traditional paper document. Clearly, the seemingly limitless number of interactive features and ways participants can provide feedback is a powerful example. Rather than being a digital version of a static document in the way websites were traditionally, CMS software allows for a wide variety

of dialogue, even as it still provides its administrator ultimate control over the design, configuration, and content. A wiki, which was designed from the outset as a collaborative documentation tool, is the ideal solution for building a truly "dynamic" planning process. Because the document itself is no longer static and linear, the planning process that revolves around it need not be static or linear either; in other words, the "short feedback loops" conceived by Lennertz and Lutzenhiser could be implemented electronically. The policy implications of this will be discussed in the following chapter.

Potential Drawbacks and Limitations

Despite its numerous benefits, an online approach to interactive, participative planning has number of potential pitfalls. First, a web based planning process would largely be limited to those with access to an Internet-connected device, meaning only those who can afford and are used to technology would be able to participate. Clearly, this would exclude a substantial portion of the population, but it should be said that those without their own Internet access can go to a public library. Secondly, in spite of security measures that can be taken to prevent attacks, a web planning portal would be as vulnerable to hackers as any other web portal. This problem is compounded by the fact that content management systems are usually full of bugs and security holes, unlike standard websites based on standard HTML, CSS, and Javascript. Furthermore, the planners in charge of the process may not exercise their administrative privileges as closely as they should, leaving

the process vulnerable to disgruntled individuals or groups; the "edit wars" that take place on Wikipedia are a glaring example of how controversial pages can defaced and modified at will by anonymous users. On the other hand, any information system with an adequate permissions management capability can overcome this problem, provided its administrators are vigilant in applying the controls to the posted content.

Third, the learning curve of the availably CMS software is too steep for most who are inexperienced with these systems. Most of those available require at least one individual with web programming experience for any significant modifications. The lone exception to this, Tikiwiki, still would require its administrators to be reasonably tech-savvy to operate. This difficulty means that a consultant may need to be sought for setup, and a paid web hosting service will be needed for the portal's installation and maintenance. However many counties, cities, and private planning firms already have the resources to set up and host the application on their existing network infrastructure.

Fourth, because the online approach potentially opens the door to so many more participants than the traditional model, the planning process may end up being less efficient, not more. Although a more direct democratic style of decision making has its benefits, it may not always result in the best outcomes for a community. Because the goal would be to solicit ever more stakeholder feedback, with constant revisions to a final plan, the process may simply end up taking longer. A timeline and deadlines for project deliverables would therefore be needed to counteract this tendency.

Furthermore, technology may result in planners exercising less control over a planning process. It is reasonable to expect that a more collaborative process could be

hijacked by stakeholders who wish to control the process and produce an outcome beneficial only to their own interests. The easier access to information that a planning web portal could potentially provide could make this scenario more likely to occur. Therefore, implementation of the application must be accompanied by clear policies and procedures that ensure equal access to the system and process for all participants.

Implications for Policy and Planning Practice

The potential use of web technology in urban planning is virtually limitless, but as the last chapter discussed, it also has its drawbacks. This chapter will investigate the implications for planning policy and process, and how each could be changed to accommodate the new technology while avoiding the pitfalls.

Web-Based Dynamic Planning: Process Changes

Given the set of problems that result from rationalism and its pervasive influence, planners would benefit from experimenting with the aforementioned web-based tools to implement new public outreach strategies and planning frameworks. This section discusses a model for a web-based planning process could look like, drawing on the collaborative planning principles advocated by Lennertz and Lutzenhimer. The proposed planning model presented here is based on the tools' capabilities, without necessarily advocating an entirely new framework. Instead, the goal is to demonstrate how use of these programs could make visions of true collaborative planning a reality. In other words, the proposed

model attempts to capture the best elements of a web-based communication toolset that complements a proven collaborative planning approach.

Unlike the traditional methodology, a web-based collaboration process would strongly resemble the dynamic planning process described in the *Charette Handbook.* It would revolve around three overarching themes: 1.) general public participation, 2.) publicly reviewed urban design, and 3.) data sharing, modeling and analysis. At all stages, it would be continuous, cyclical, efficient, and responsive to changing conditions and opinions. Ideally, web-based planning would combine the best aspects of rationalism- emphasis on data analysis- with the inclusiveness of collaborative planning tools. If realized, web-based planning could potentially lead to community planning efforts that are well-designed and effective, and more accurately reflect public opinion.

Public Participation

The utilization of groupware such as Tikiwiki would grant community members unprecedented access to the planning process, realizing the collaboration that planners have wanted for decades. In stark contrast to attempts at collaborative planning in the real world, which are discrete and occur intermittently through the year, an online approach could theoretically run continuously. Unlike actual public meetings, there are no practical constraints for simply leaving the CMS running constantly, with its various features enabled as conduits for public input. Just as significant, no geographic constraints exist, as participants can join in remotely; this is especially important for those who are unable to come to attend meetings. With access to Tikiwiki's wide variety of features, users could

post comments, read documents posted by planners via the file gallery system, start their own blogs or comment on others' blog postings, read articles, and post images of what they like or dislike about their community. Notably, they can also take part in online surveys and polls, just as they do in the real world. Tikiwiki offers a digital equivalent of almost every outreach strategy employed by planners today.

Urban Design

The increasing demand for innovative design in residential and commercial development indicates a rising level of public interest in the quality of the urban built form. Outside of some charettes and the odd architectural review boards established in some localities, there currently exists almost no mechanism by which citizens can participate in the physical design of their cities. Google Earth and Sketchup offer planners and citizens a means to show what they want their community to look like, comment on what they don't like about it, and to review design proposals submitted by developers. Because Google Earth can display building models and land features virtually, it eliminates the need for citizens to participate in public hearings in person. Furthermore, the 3D environment offers a realistic context, and thus a more accurate representation of a design than a typical CAD sketch. With its ease of use and ability to be embedded in a CPSS, Google Earth affords planners the ability to make urban design a much more adaptive feature of the planning process than the traditional rationalist method has allowed.

Data Modeling and Sharing

Although web-planning would emphasize public participation more than rationalism does, it would retain the emphasis on data modeling and sharing. Despite the skepticism of some theorists who have discounted the value of data analysis in planning (Innes, 53), it remains in reality a vital aspect of the process. For example, land uses and the built form are heavily influenced by the use of transportation planning data models, as the outputs of these models are typically used to determine the routes and width of roads and rights-of-way. Although traditional transportation models such as Cube and TransCAD do not sufficiently account for other factors such as development patterns and environmental quality, these modeling techniques continue to be employed as the standard guide in transportation decision-making. Unfortunately, transportation decisions are usually made without significant levels of public input, as there has not been a means to share such important information. However Google Earth provides planners the ability to display this data online and explain its meaning, thereby inherently recognizing the political nature of such data and its implications. This approach would mean that transportation planning could potentially be more closely integrated with land use decisions and public input, creating a more holistic and realistic planning process.

Other kinds of pertinent data could also be posted in an online environment. For example, market analyses of planning study areas, including methodology and assumptions, could be posted and integrated with wiki pages created for local neighborhoods. Such locally-based wiki pages could also include historic background

information, survey results, inventories of businesses, descriptions of ongoing and future development projects, zoning and land use information, and other information specific to that area. Were a concerted effort made to use a wiki in this manner, the result would be a Wikipedia-style database of community information, of enormous potential in a web-planning process.

The Process Foundation: The Planning Wiki

A planning wiki would be used as the central shared repository for virtually all types of data and analyses used in planning projects, including GIS data, market analyses, transportation data, neighborhood history and more. Although it would be a monumental task to update such a planning wiki of neighborhood based data inventory, it would be a useful tool for both planners and for private businesses. This planning wiki would not however just have to be limited to market analysis. Information common to most planning documents, such as historic background and existing conditions, SWOT analysis, and overviews of study areas could be documented in a central repository easily accessible to all. Unlike paper documents, a planning wiki can be edited to update its information by creating threads to show the development process inputs. Another advantage is that goals and implementation strategies can be changed and modified to suit the changing conditions and needs of communities; for example, if the planning board and/or citizens find that their recommendations are not being implemented, or are causing more harm than good, planners would no longer be bound by them. Like Lennertz and Lutzenhimer's concept of

dynamic planning, a planning wiki would afford a more flexible, open, and more efficient way of performing many of the stages of the collaborative planning process, without the duplication and constraints plaguing its rationalist counterpart.

The Structure of an Online Collaborative Planning Framework

Bill Lennertz and Aarin Lutzenhimer define dynamic planning as a "three-phase, holistic, collaborative planning process during which a multiple-day charette is held as the central transformative event. Dynamic planning is designed to assure project success through careful charette preparation and follow-up" (4). Web-planning seeks to build on this concept, freeing planners from the geography and time constraints that have long been obstacles. While web-planners may choose to limit a charette to a particular time period, they are not required to do so; this enhanced dynamic planning process demonstrates the room to maneuver that a planning wiki could potentially give to planners. The *Charette Handbook* represents the latest in charette process development and is a serious effort towards forging a feasible collaborative planning strategy. For this reason, it was judged an appropriate basis for determining best practices in an online collaborative process. The following outline is by no means the only way to use a planning wiki, but is a synthesis of established practice with a new approach, and is based closely on *The Charette Handbook's* suggestions for developing a viable strategy. Each phase and its workflows are drawn directly from the book, with suggestions on how to carry out their strategy with Tikiwiki.

Phase One: Research, Education, and Charette Preparation

- Project Assessment and Organization
- Stakeholder Research, Education, and Involvement
- Base Data Research and Analysis
- Project Feasibility Studies and Research
- Charette Logistics

As outlined in the book, "the tasks in phase one are designed to provide the support necessary for success and the preventions required to avoid possible difficulties in phase two, which is the charette, and phase three, project implementation"(30). As noted previously, dynamic web planning would not differ substantively from what Lennertz and Lutzenhiser proposed. However, their Objectives, Strategies, and Measures (DOM) document, SWOT analysis, and other proposed concepts would be created and published via the CPSS, as would strategies for stakeholder education and data analysis. The difference would be that the participants in the charette would have access to this information before the charette even began, because the existing databases in the CPSS would serve as a useful starting point for discussions. This would hopefully lead to a more efficient process and better informed participants later on.

Phase Two: The Charette

- Organization, Education, Vision
- Alternative Concepts Development
- Preferred Plan Synthesis
- Plan Development
- Production and Presentation

Because the charette traditionally revolves around a series of face-to-face work sessions by its participants, the extent to which this phase could take place online is debatable, and is dependent on the scenario and the preferences of the team running the charette. At the very least, the in-person sessions could be augmented with online documentation and discussion, potentially expanding participation to those who cannot be physically present in the meetings. The CPSS could even be used simply to provide real-time updates of discussions in meetings, so that other interested parties could follow along. The standard charette work cycle does not have to change, but some stages, such as the public review of alternative concepts and the open house review, could be conducted online. This could free resources to concentrate on product development.

Phase Three: Plan Implementation

- Project Status Communications
- Product Refinement
- Presentation and Product Finalization

The implementation stage may be where an online complement to a dynamic planning process may provide the greatest benefit. As the authors of *The Charette Handbook* point out, the implementation phase "should be made as short as possible to reduce the risks associated with changes in political and regulatory leadership"(120). If used to its fullest extent, a CPSS would achieve a greater degree of transparency at one of the most vulnerable points of a planning process. Too often, implementation is where good plans are ignored for political reasons, and are circumvented by developers who wish to stay out of the public view. A continuously updated CPSS that shows types of development and their patterns, via interactive maps and blog posts, would keep the public informed about the progress and direction of a plan's implementation.

Web-based Dynamic Planning: A Tutorial

In order to understand how the Tikiwiki groupware package could be integrated into a planning process, this section describes a general template for applying the toolkit to the various tasks of a collaborative charette. The most important tools that could be employed at each stage will be demonstrated, with instructions on how to set up the tools for tasks that might occur in such a scenario. This section is not a complete user manual on how to administer and customize the system; rather it is merely a starting point for planners who wish to employ Tikiwiki in their existing public outreach strategy. Nor is this scenario the only way to organize a charette, as each unique situation requires a unique approach. Full technical documentation for Tikiwiki can be found online at http://twbasics.keycontent.org/tiki-index.php.

Upon installation of the system, the planner-administrator should begin enabling the features desired by accessing the Administration Panel, as shown in Figure 1:

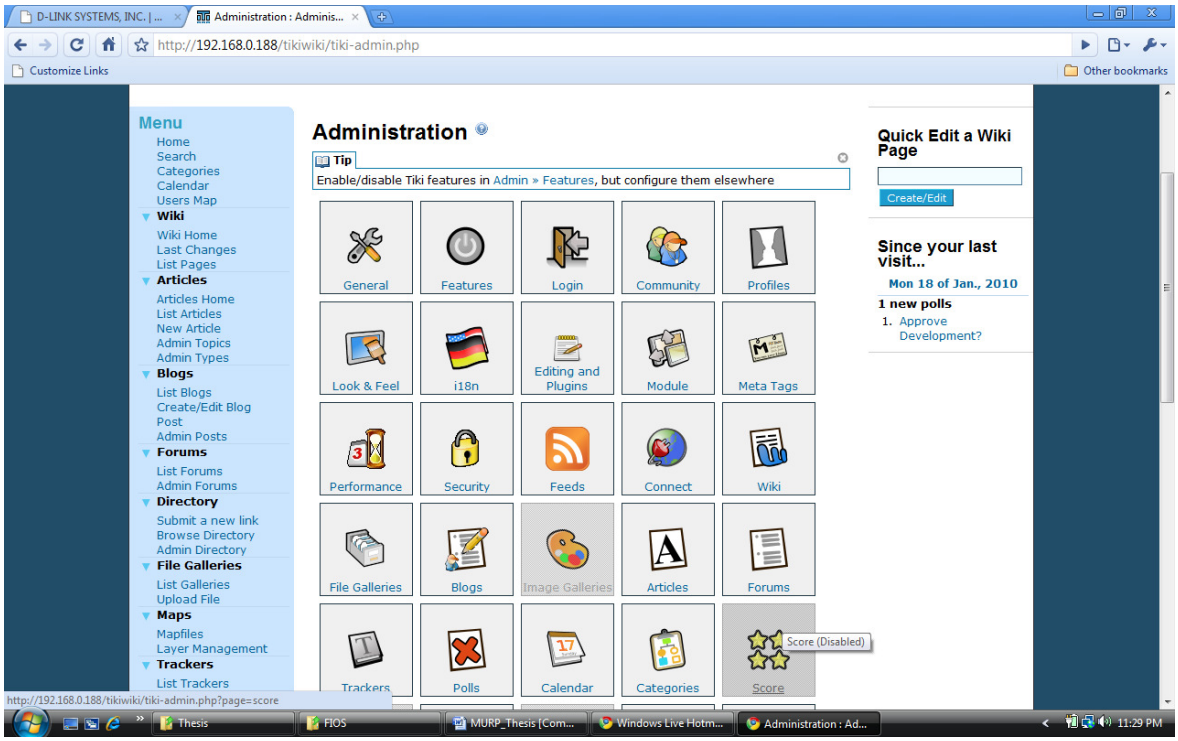

Figure 1: Administration Panel

Details of how to use this panel can be found in Tikiwiki's documentation, but it is helpful to know that this panel controls which features, such as forums, blogs, maps, and other features that can be added, enabled, and configured.

Configuring User Groups and Security for Stakeholders

Before the planners directing the charette can even begin the project, they must take steps to ensure that access to the application is limited to a controlled group of users who have been approved for participation. Only true stakeholders should be given access, which

means limiting participation to people from relevant geographic areas. The planners should begin by posting contact information on the homepage of the project website, by which prospective participants can request access. Planners can review the requests accordingly, and grant access only to those users; visitors to the website should not be allowed to register on their own. To disable this feature, the administrator would click on the Features button, and then the Login button on the blue menu at the top. The box labeled "Users can register" should be unchecked, and saved by pressing the "Change Preferences" button, as shown in Figure 2.

Figure 2: Blocking User Registration

The system should confirm that the changes were made, as indicated in Figure 3:

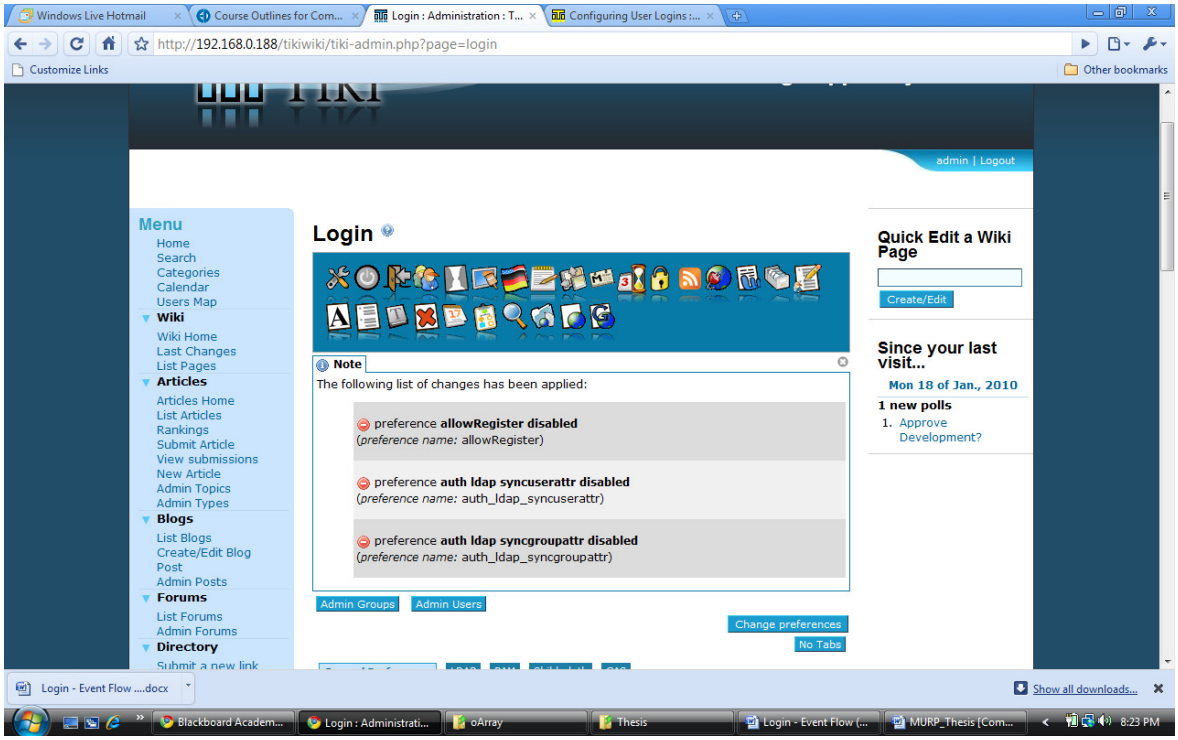

Figure 3: Confirmation of changes made to registration permissions

This way, the "Register" button will no longer appear on the homepage, and only users with specific approval from the project planners will be able to contribute content to the system. In fact, Tikiwiki could effectively be configured as a private website, with the home page only displaying the following to unregistered users, as depicted in Figure 4:

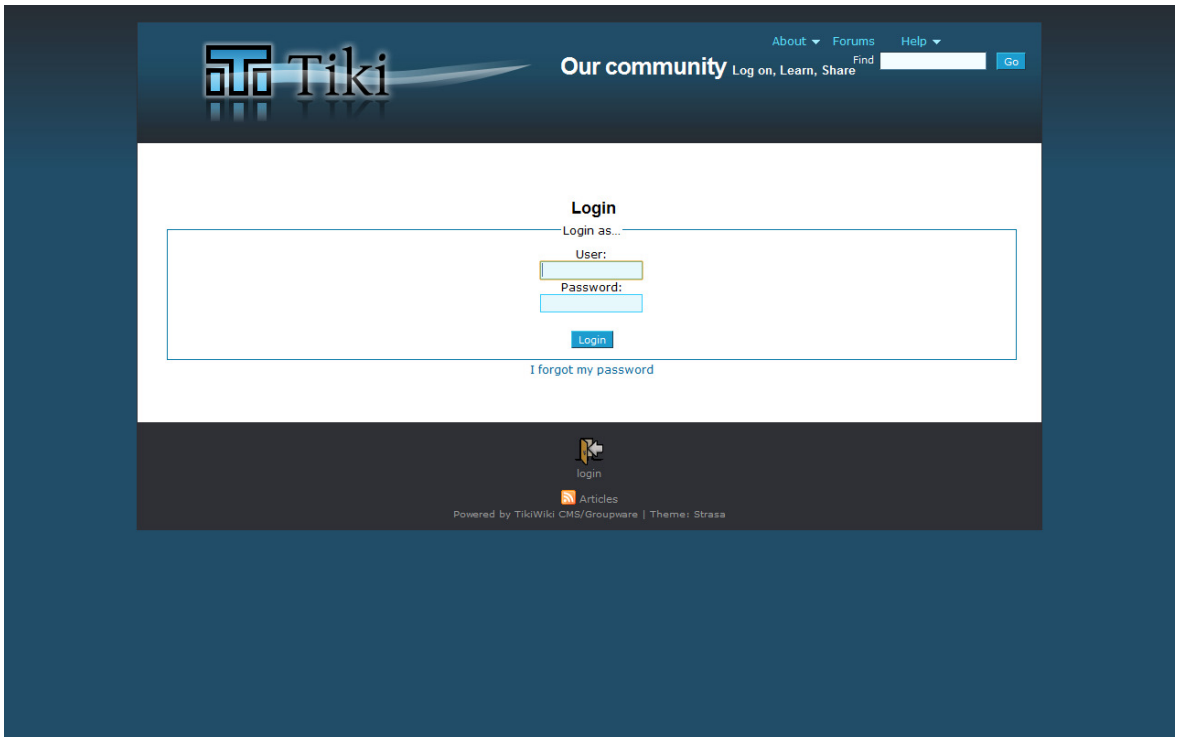

Figure 4: Tikiwiki with the Registration feature removed

Further setup instructions can be found on the following page of the Tikiwiki user manual:

http://twbasics.keycontent.org/Configuring+User+Logins&structure=TikiWiki+for+Smarties

Stakeholder Identification and Registration

Once the process of identifying stakeholders has begun, the charette leaders should begin granting them access to the Tikiwiki CPSS. Since users cannot register themselves, the planners would be required to add the users manually. To add users, the administrator should select "Users" at the bottom of the Admin menu on the left hand side, and then the "Add a New User" tab, demonstrated in Figure 5:

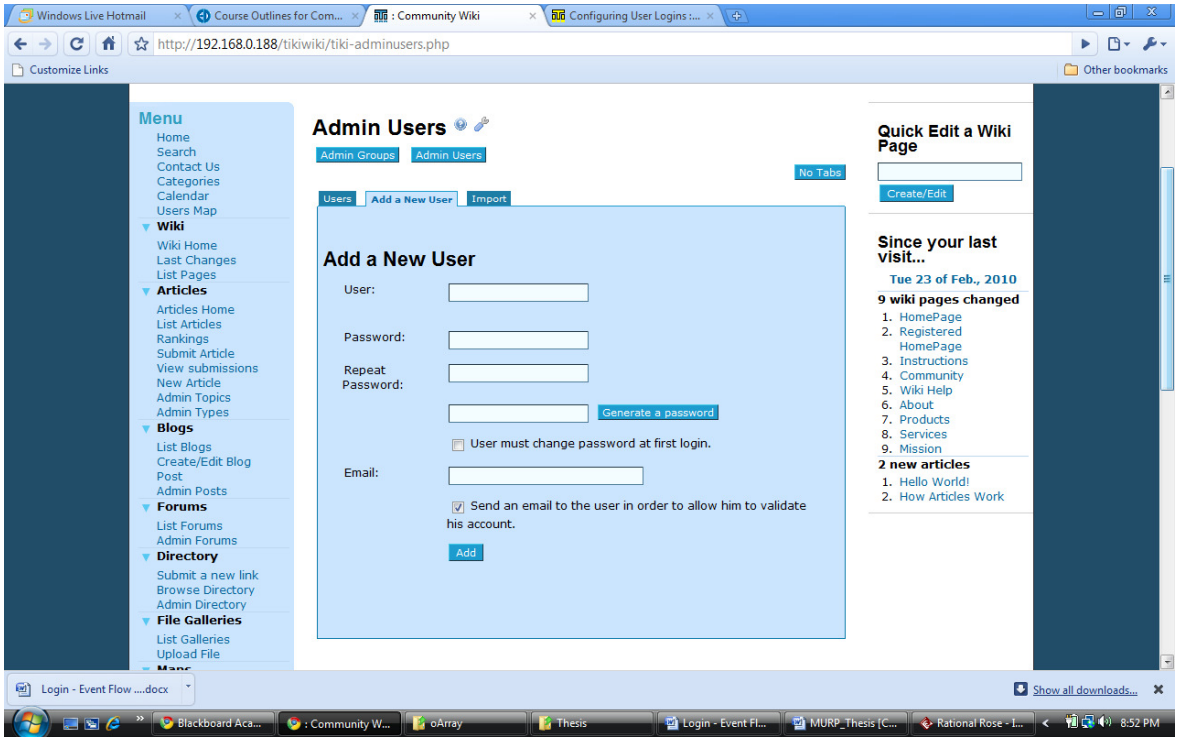

Figure 5: Adding new users

The administrator should take extra care to understand and think through what kinds of permissions users should have to edit content in the system. Again, this stage of the system's configuration would go hand-in-hand with Stakeholder Identification, where

the project team creates an initial list of stakeholders who must be involved if the project is to be successful. However, the level of involvement in the process will depend on how greatly the stakeholder is invested in the final outcome. The project team should then organize stakeholders into relevant user groups and assign editing permissions accordingly. "Primary" stakeholders, such as elected officials and other community leaders, may be given more editing powers than members of the general public. They may also be given the ability to post their own blogs or articles- it will be explained later how this could happen.

No matter how the project team decides to allocate administrative privileges, it must be understood that this is perhaps the most critical set of decisions that they will make for the duration of the charette. Decisions made on how to grant control of online content to stakeholders may very well alter the course of the entire project. In addition to agreeing on what the various stakeholders should be allowed to contribute, the planners and system administrator(s) should have a thorough understanding of how permissions actually work in Tikiwiki. Failure to understand permissions could potentially lead to serious problems later on. To learn more about Tikiwiki's permissions system, the administrator should again consult the user's manual: http://twbasics.keycontent.org/Understanding+Groups&structure=TikiWiki+for+Smarties

Project Initiation

As described above, the first stage of the process is Project Assessment and Organization Tools and Techniques. The charette's organizers can immediately begin using the CPSS by posting the Objectives, Strategies, and Measures Draft on the front page of the system. The OSM document will therefore be the first thing that participants see when they login. Along with the Mission Statement and Vision, it would serve as a useful reminder of the project's overarching purpose. Because these documents serve as guides for the project's goals, direction and parameters, they should not be editable by anyone but the planners themselves. To "lock" the page, the system administrator should click on the "Perms" button at the bottom of the page being used to display the documents. This is demonstrated in Figure 6 and 7:

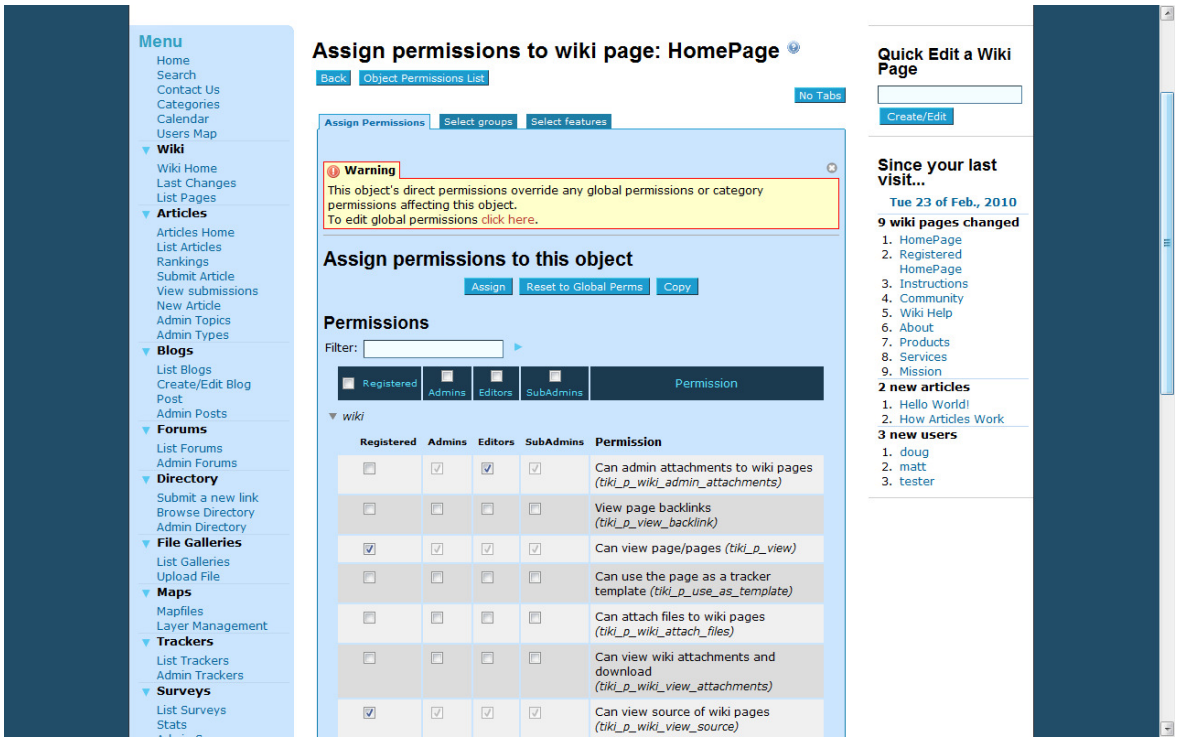

Figure 6: Configuring permissions wiki page

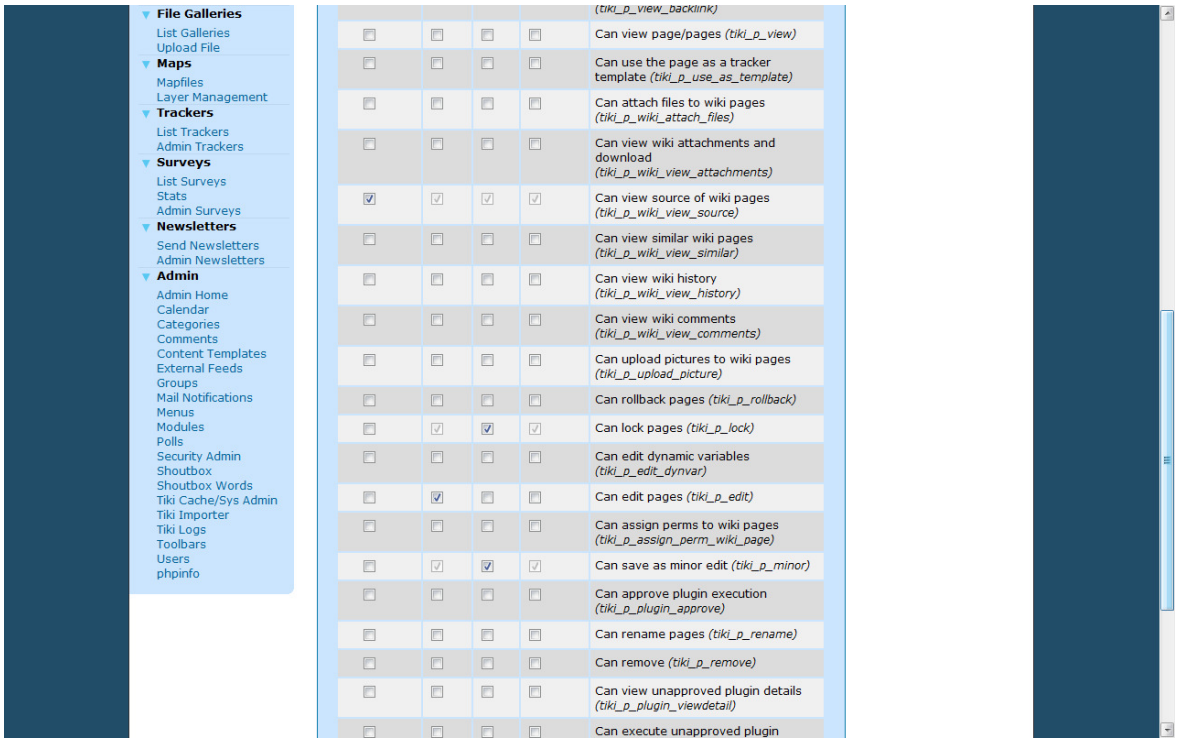

Figure 7: Configuring permissions (continued)

Here, the permissions for registered users to edit pages, view wiki history, and other options have been unchecked. Figure 8 shows what the page may look like to a registered user, depending on the permissions granted by the administrator:

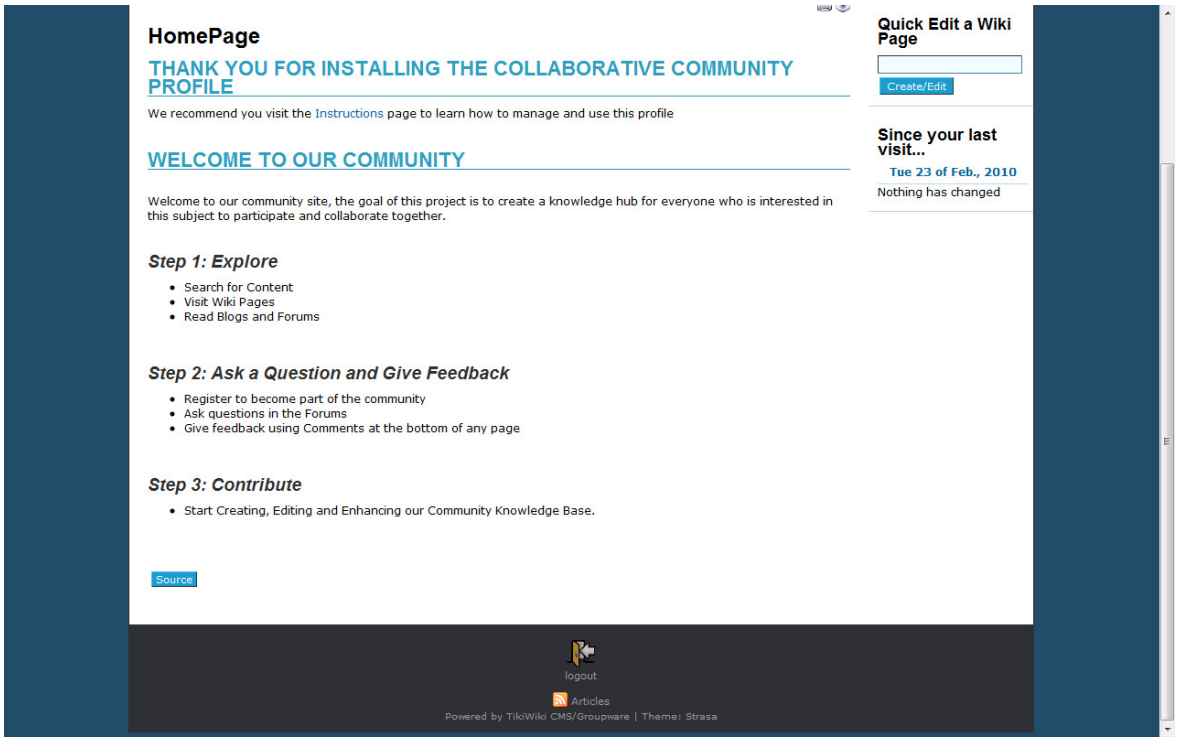
HomePage
THANK YOU FOR INSTALLING THE COLLABORATIVE COMMUNITY PROFILE
We recommend you visit the Instructions page to learn how to manage and use this profile
WELCOME TO OUR COMMUNITY
Welcome to our community site, the goal of this project is to create a knowledge hub for everyone who is interested in this subject to participate and collaborate together.
Step 1: Explore
Search for Content
Visit Wiki Pages
Read Blogs and Forums
Step 2: Ask a Question and Give Feedback
Register to become part of the community
Ask questions in the Forums
Give feedback using Comments at the bottom of any page
Step 3: Contribute
Start Creating, Editing and Enhancing our Community Knowledge Base.
Source
Quick Edit a Wiki Page
Create/Edit
Since your last visit...
Tue 23 of Feb., 2010
Nothing has changed
logout
Articles
Powered by TikiWiki CMS/Groupware | Theme: Strasa

Figure 8: A Registered user's view of a locked wiki page

In Figure 8, the "edit" button is missing. This is how a wiki page should be configured if it needs to remain fixed. This same process can be used for posting other documents in this phase, such as the Complexity Analysis, the Dynamic Planning Process Road Map, and the Charette Ready Plan. Although these documents are meant for use by

the project team only, it may be prudent to post them on the CPSS in the interest of transparency.

Communication with Stakeholders

It is during the *Stakeholder Research, Education and Involvement* phase that the advantages of a groupware package like Tikiwiki truly can be taken advantage of. The authors of *The Charette Handbook* list a variety of access tools for stakeholder outreach, including phone calls, faxes, emails, web notices, flyers, mailings, signs, door hangers, and newspaper, radio, and TV announcements. However, Tikiwiki offers several electronic equivalents, namely forums, blogs, surveys, polls, and articles that may come in handy during this stage. Team leaders may wish to give key stakeholders access to a blog, or even select other stakeholders as "spokesmen" for community groups. These moderators can use the blogging feature to write their thoughts during the subtasks of this phase, such as information exchange and vision development. Before a blog is established, the administrator should ensure that blog posts can be discussed by participants. To invoke the blog, the user clicks on the Blogs button on the Administration page, and then selects "Post Level" under "Comments", as shown in Figure 9:

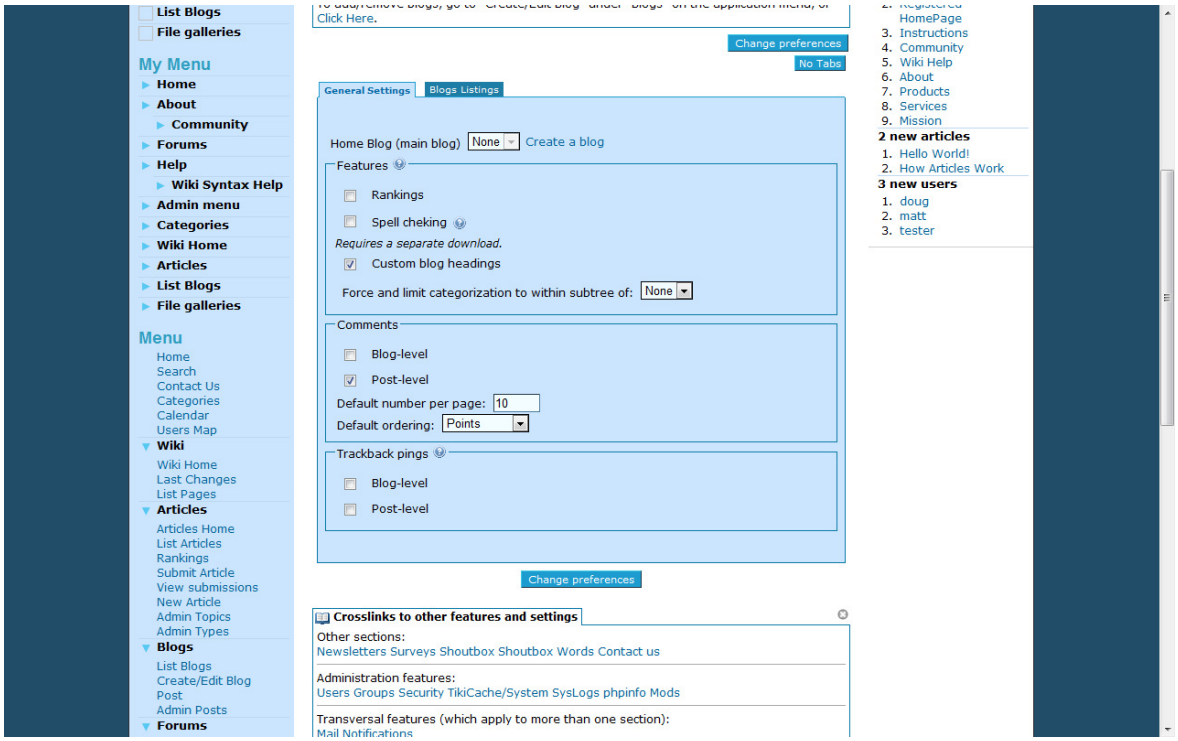

Figure 9: Configuring the blogging tool

The administrator should then click "Change Preferences" to save the changes. To create a blog, the administrator should click on "Create/Edit Blog" under the Blogs section of the application menu to the left. This can be seen in Figure 9 on the left sidebar.

At this point, the administrator should again take care to assign permissions carefully. If the project team wants only certain stakeholders to have the ability to create a blog, forum thread, or other feature, the administrator should navigate to the Admin Groups page by clicking on "Groups" under the Admin section of the application menu sidebar (Figure 10):

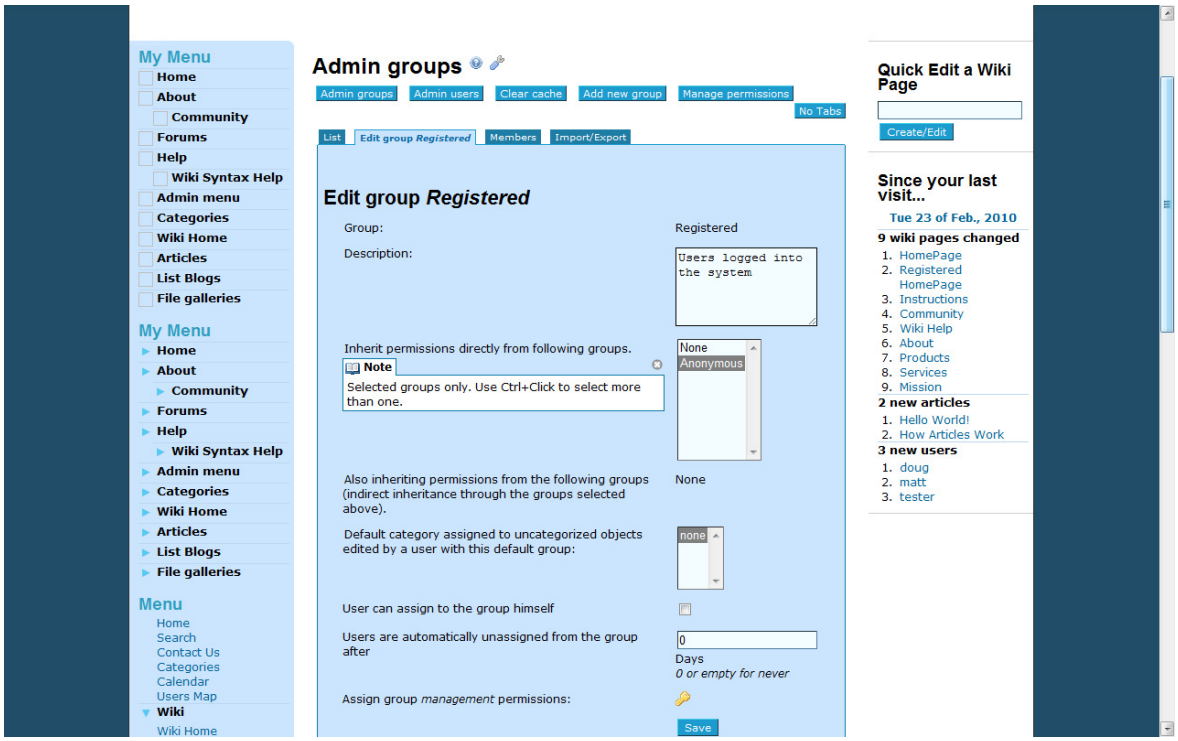

Figure 10: Assigning permissions to groups of users

To allow or disallow users to use certain features, he/she should then click on the "Manage Permissions" button. Under the "Assign Permssions to global" screen, the administrator should then ensure that Registered users cannot create their own blogs, and that this ability is reserved for the Admins, Editors, and SubAdmins group, as shown in Figure 11:

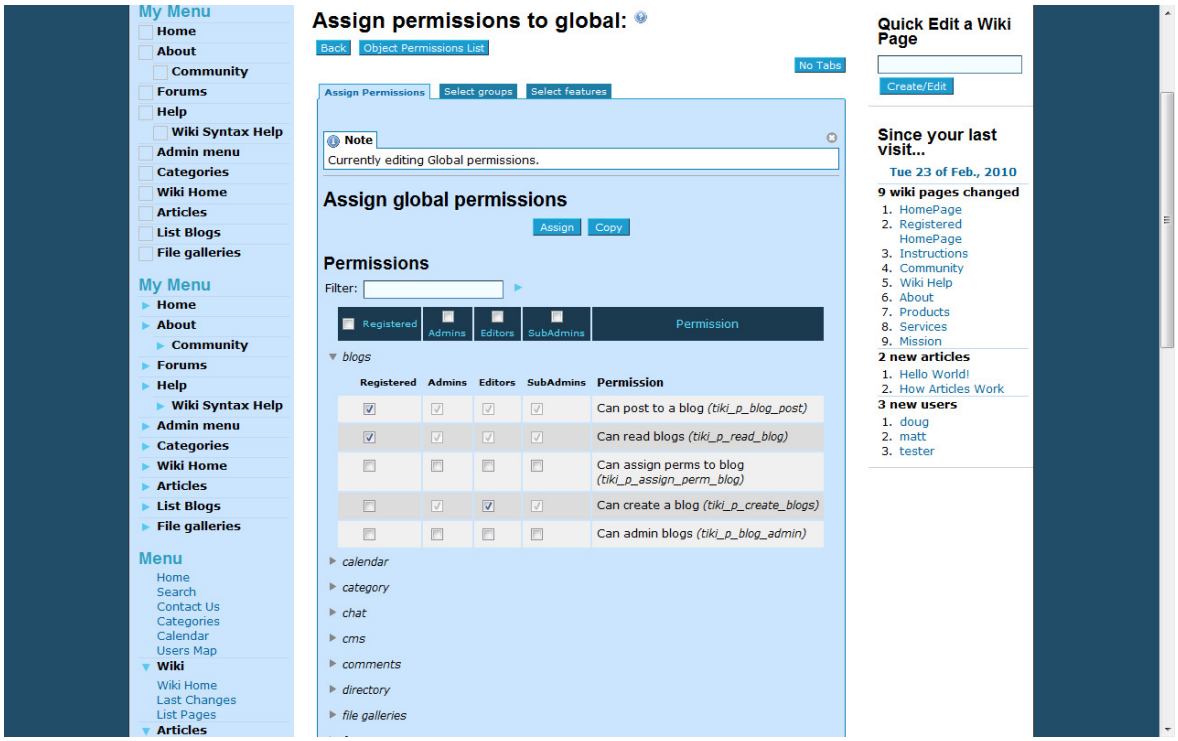

Figure 11: Assigning permissions to groups of users (continued)

To confirm the changes, the "Assign" button must then be clicked. Now, when a Registered user is logged in, their Application menu will have the option to list blogs, but not to create one. The proper result is depicted in Figure 12:

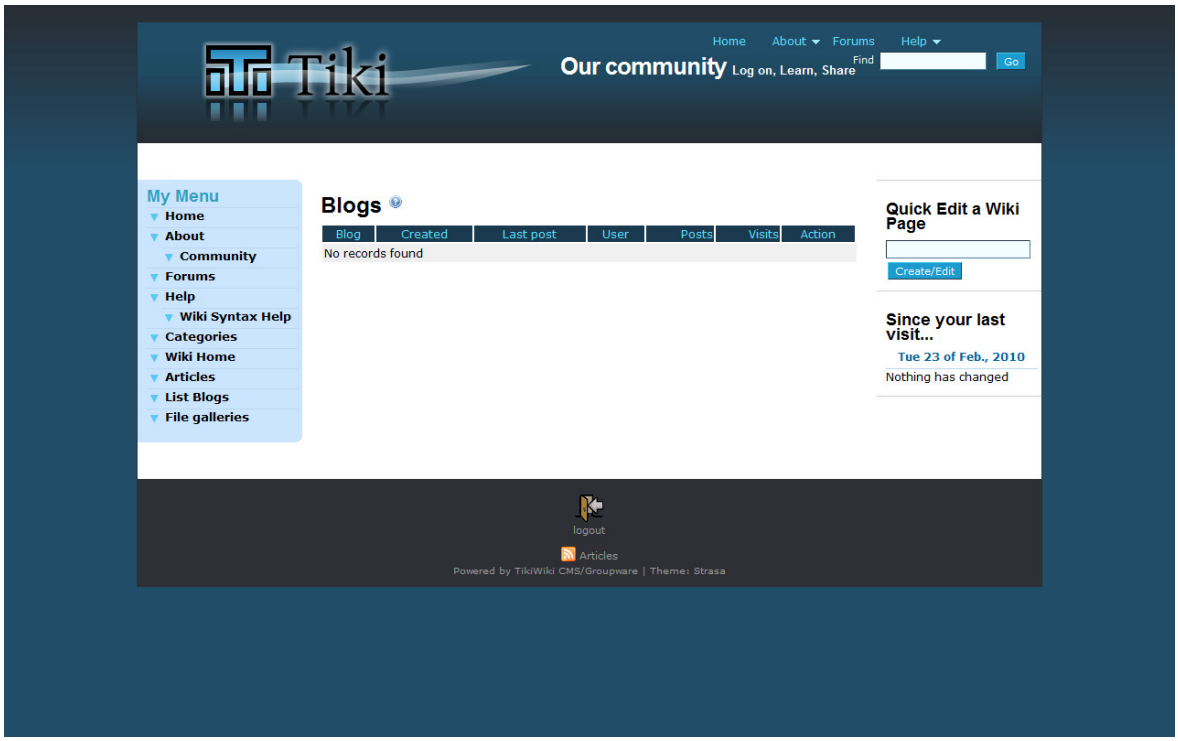

Figure 12: A Registered user's view of Tikiwiki, with appropriate permissions set

If the project leaders want blogs to appear on this screen, they must be created by a member of a group who has permission to create one. To create a blog, an editor or administrator must be logged in, and must click on "Create/Edit Blog" under Blogs on the application menu. The appropriate screen will then appear (Figure 13), where the blogger can configure the blog as desired:

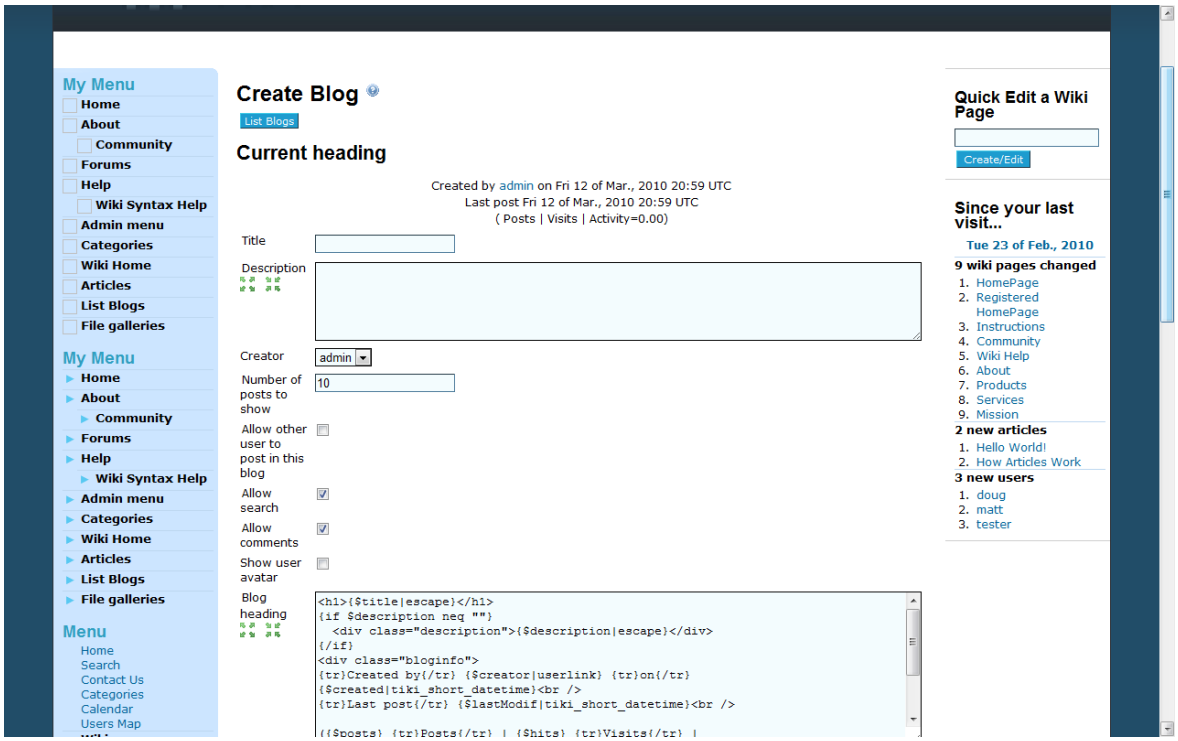

Figure 13: Creating a Blog

Once the blog is configured and saved, it will appear under the blog list. Posts can then be added, and comments can be made by registered users. However, any comments must be approved by the moderator before they will be displayed:

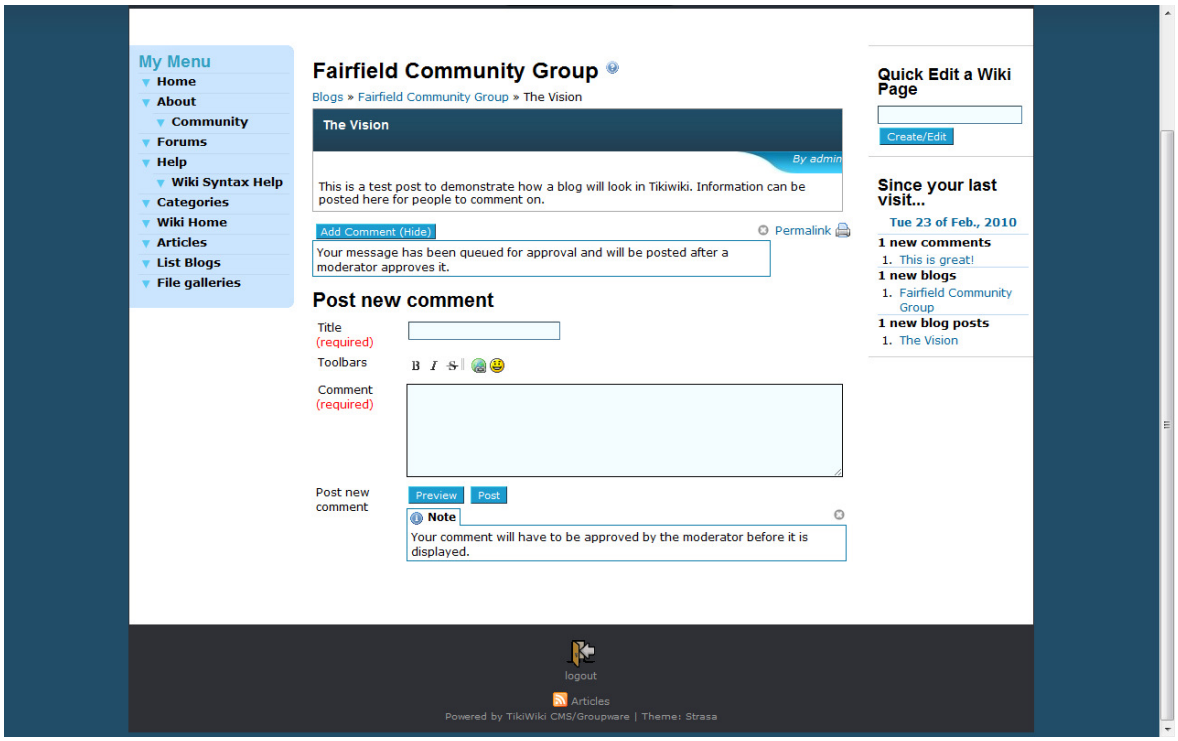

Figure 14: A Registered user's view of commenting on a blog post

The blog moderator can then approve or reject the comment, once they have selected the blog from the blog list and the clicked on the "Comments" button. The approve/reject buttons appear in the top right hand corner of the comment. From the Registered user's perspective, the blog should resemble the one displayed in Figure 15 if the comments button is pressed:

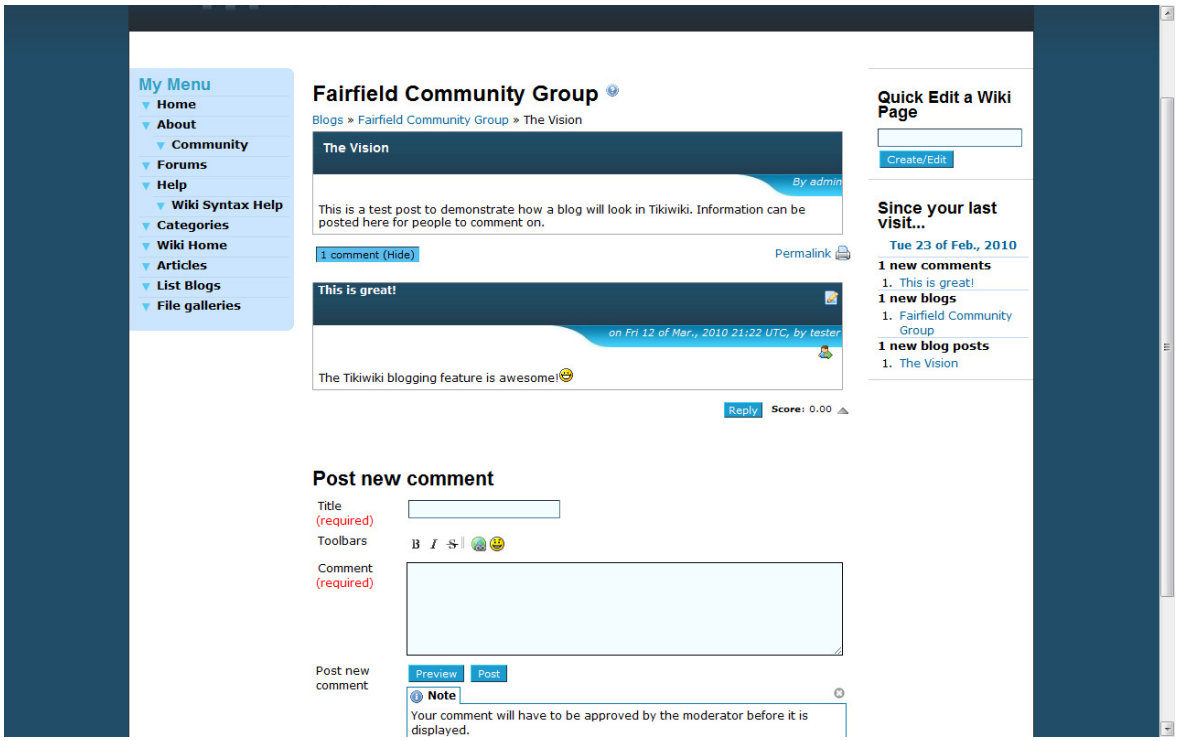

Figure 15: A Registered user's view of commenting on a blog post (continued)

Again, the multi-layered content security is critical for successful management of the charette. In sensitive political discussions that are inevitable in most planning processes, planners must retain control over the discussion, and reject commentary that is inflammatory. In short, they should follow the same guidelines that cover any online discussion tool.

Configuring and setting up the forum tool is a very similar process to the blog, and as shown below, the forum has almost the same formatting as the blog does; the main difference lies in that replies show the original comments, whereas replies to a blog post are stand-alone. For discussion between charette participants and leaders, either tool would

function well for facilitating debate and building consensus. Once again however, the team leaders should ensure that only they and carefully selected moderators have the ability to create discussion threads.

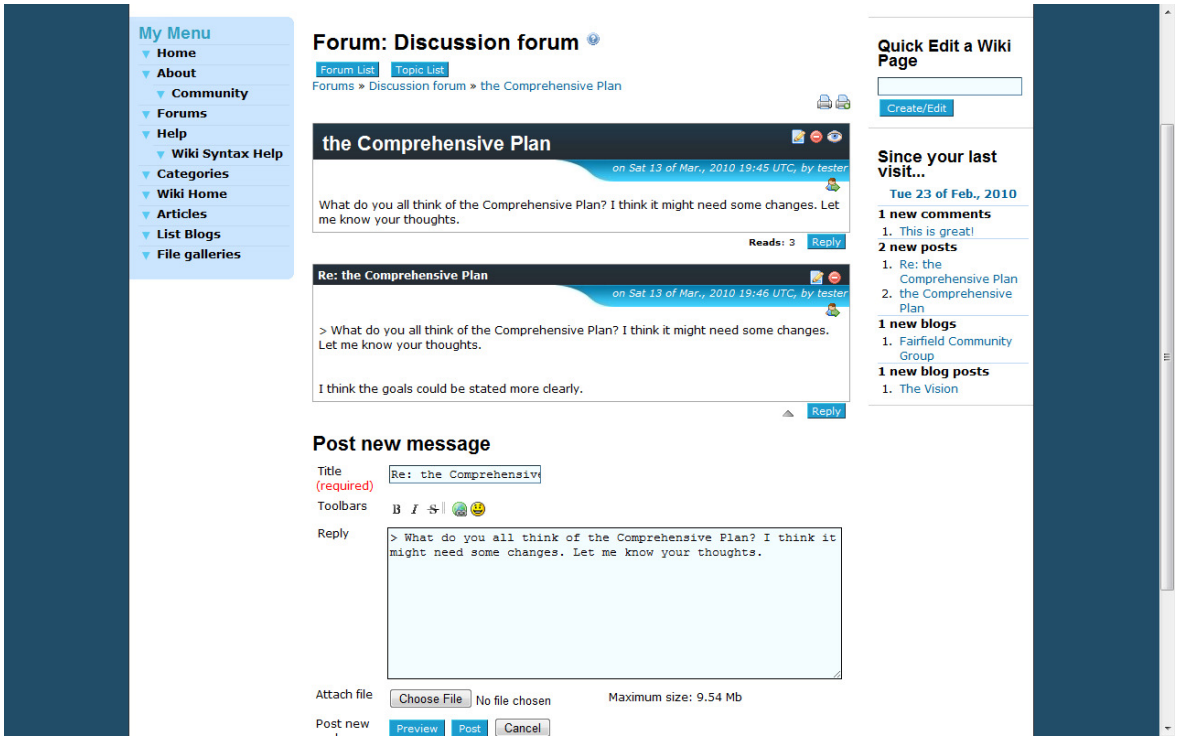
My Menu
Home
About
Community
Forums
Help
Wiki Syntax Help
Categories
Wiki Home
Articles
List Blogs
File galleries
Forum: Discussion forum
Forum List
Topic List
Forums » Discussion forum » the Comprehensive Plan
the Comprehensive Plan
on Sat 13 of Mar., 2010 19:45 UTC, by tester
What do you all think of the Comprehensive Plan? I think it might need some changes. Let me know your thoughts.
Reads: 3
Reply
Re: the Comprehensive Plan
on Sat 13 of Mar., 2010 19:46 UTC, by tester
> What do you all think of the Comprehensive Plan? I think it might need some changes. Let me know your thoughts.
I think the goals could be stated more clearly.
Reply
Post new message
Title (required)
Re: the Comprehensive
Toolbars
Reply
> What do you all think of the Comprehensive Plan? I think it might need some changes. Let me know your thoughts.
Attach file
Choose File
No file chosen
Maximum size: 9.54 Mb
Post new
Preview
Post
Cancel
Quick Edit a Wiki Page
Create/Edit
Since your last visit...
Tue 23 of Feb., 2010
1 new comments
1. This is great!
2 new posts
1. Re: the Comprehensive Plan
2. the Comprehensive Plan
1 new blogs
1. Fairfield Community Group
1 new blog posts
1. The Vision

Figure 16: Posting a new message in a discussion forum

A third stakeholder communication tool similar to forums and blogs is the articles tool. Articles appear in basically the same format as blogs and forum, and are configured in basically the same way, but the key difference is that articles can be posted at a specified time and date. For example, if the project leaders wish to delay posting a public announcement, they can select the time and date they wish the announcement to appear.

Forums and Blogs cannot do this, and Articles allow a little more flexibility in this area. Configuration of Articles is shown in Figure 17:

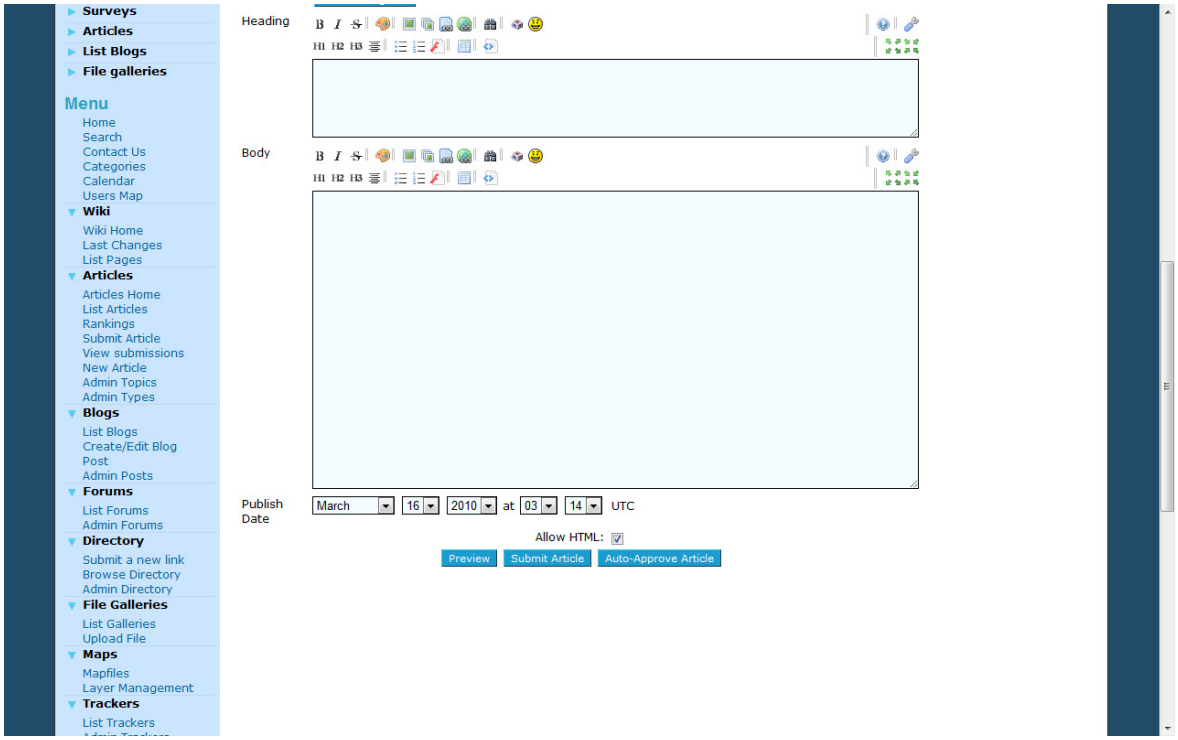

Figure 17: Scheduling an Article Post

Another useful way to assess stakeholder opinion is to conduct a poll. This would allow project leaders to get a feel for what participants are thinking in a quick and easy manner. For example, after a workshop where community members are given the chance to share their thoughts, the project leaders may want to poll the charette participants on whether they feel they had a real chance to voice their opinions. If some participants feel that they have not been able to do so but are unwilling to say so explicitly, a quick poll

would tell the project leaders if they need to listen more carefully. To configure a poll, the administrator should first ensure that only registered users are able to vote. This can be done by deselecting "Anonymous voting" under the Poll Administration page shown in Figure 18:

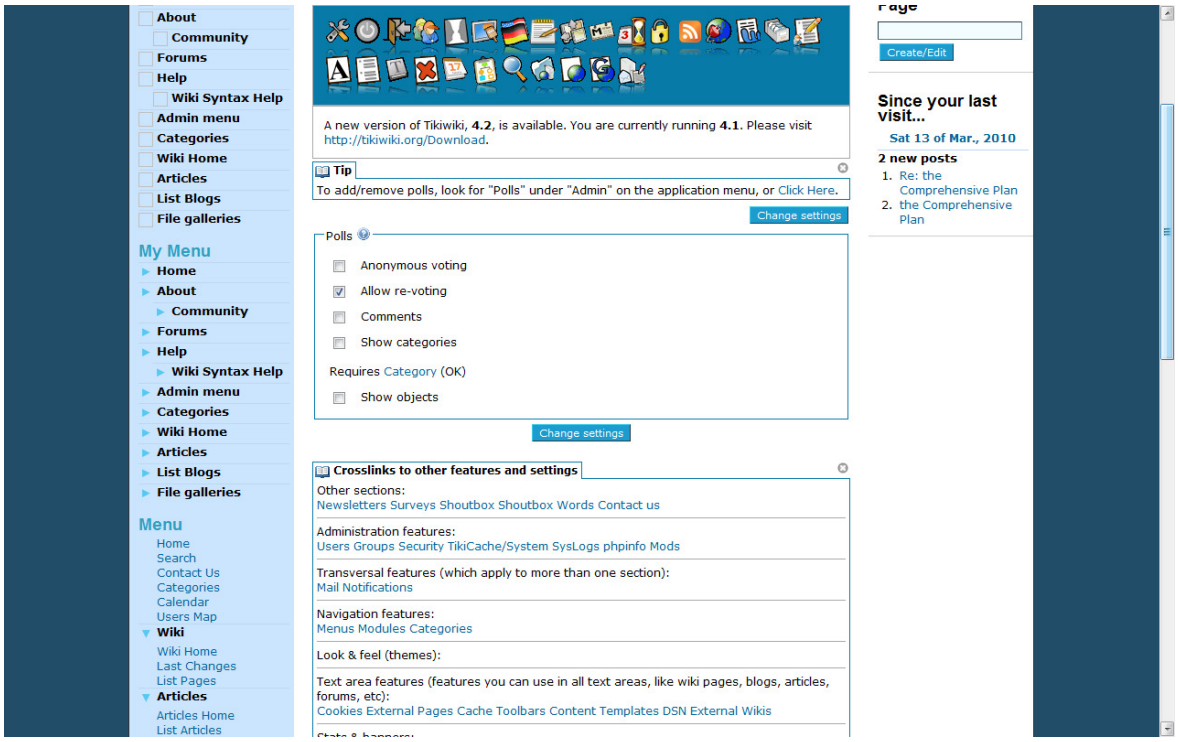

Figure 18: Configuring the polling tool

The next step is to give Registered users the ability to vote in polls and to view the results, or any other abilities the administrator may wish to grant to this group. To grant the right permissions, the administrator must choose Admin>Groups>Polls, and check the appropriate boxes, demonstrated in Figure 19:

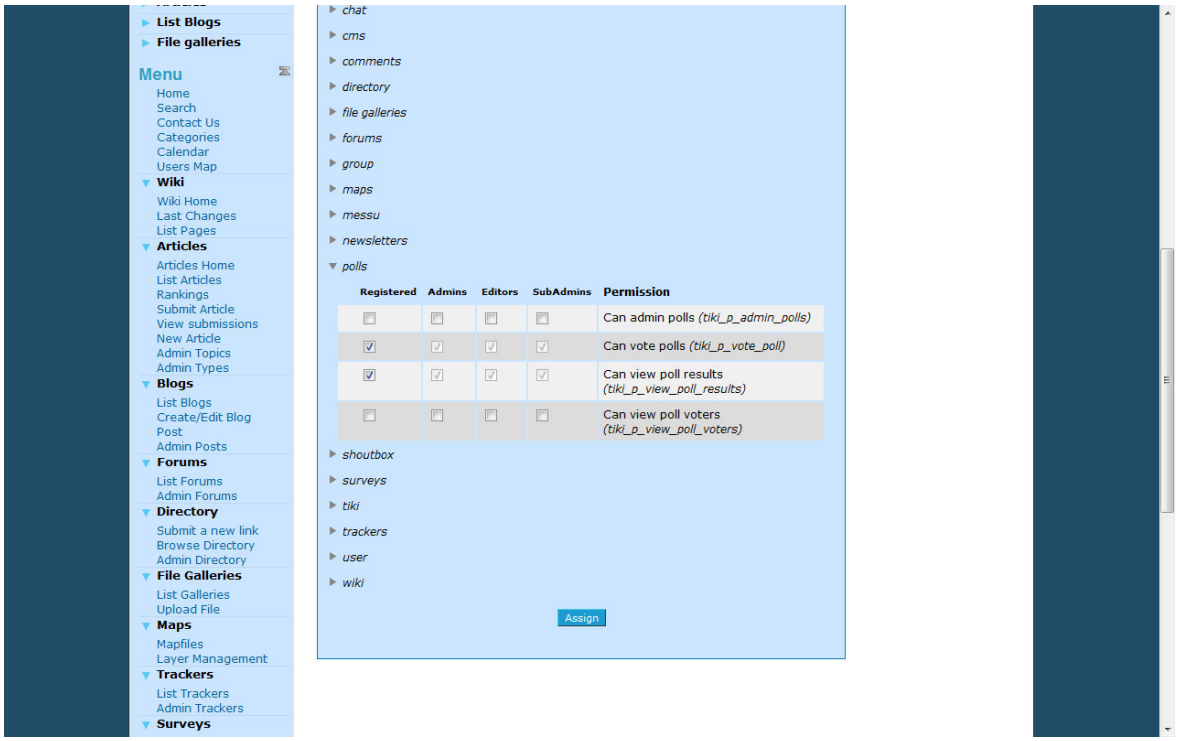

Figure 19: Granting permission to Registered users to take the poll

Once permissions have been granted, the administrator should select Polls under the Admin menu, and then create the poll by giving it a title and its options. Under the "Create Poll" tab, the title can be added, along with options by clicking "Toggle Quick Options" and then "Add Option" for each possible answer that the poll's respondents could select. The following example has four options, including "yes", "no", "somewhat", and "I don't know what you're asking". The poll is then created by clicking "Save" (Figure 20):

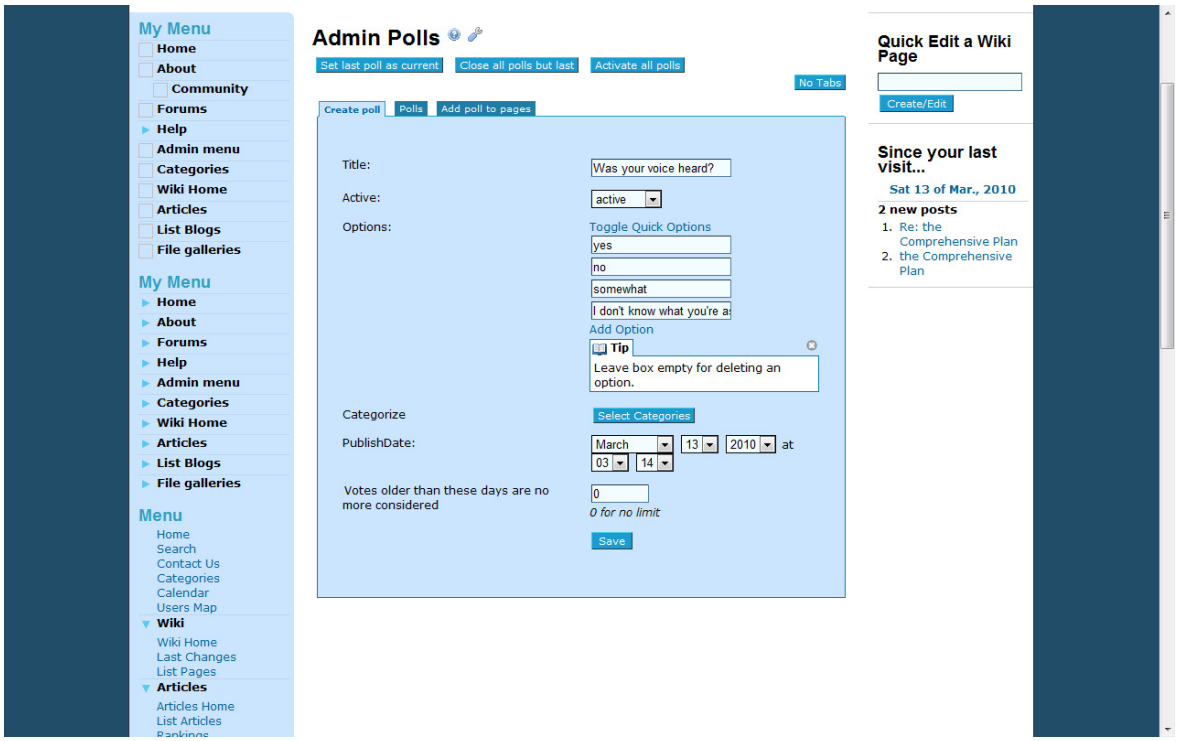

Figure 20: Creating a poll

If the administrator changes the status to "Template", the poll can then be added to a specific page. For example the poll could be added to the Registered home page, but it will be a duplicate of the original copy. Results of the poll can be seen by the administrator by clicking on the Results button under the Action column. In order to vote in a poll, a user must select the poll and then "Vote" in order to choose an option for that poll. Figure 21 depicts how results will be displayed immediately.

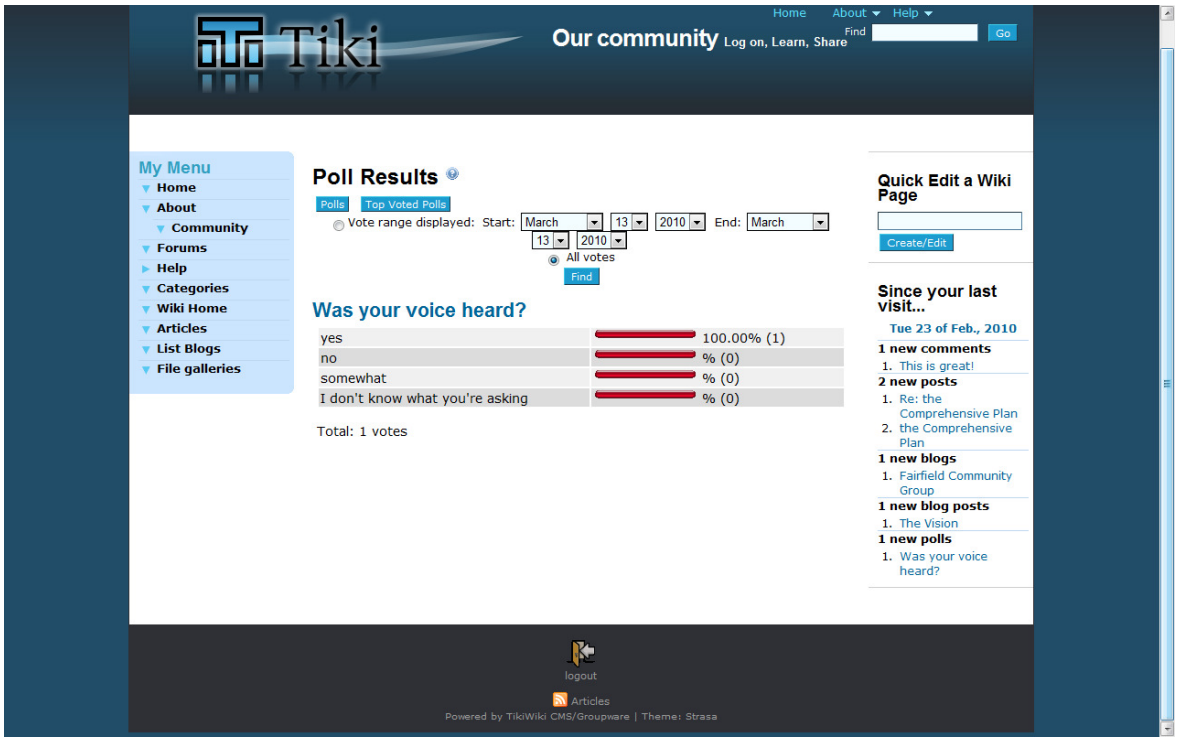

Figure 21: a Registered user's view of a poll after voting

Surveys can be used for a similar purpose, but unlike polls, they allow for open-ended questions where respondents can elaborate. Creating a survey is a fairly simple process; the administrator can do so by clicking "List Surveys" and then the "Create/Edit Surveys" tab, and then "Save". As always, the correct permissions must be set so that registered users can take the survey. Once a survey has been created, questions can be added to it, including rating, selecting from thumbnail images, short text, and other options, such as in Figure 22:

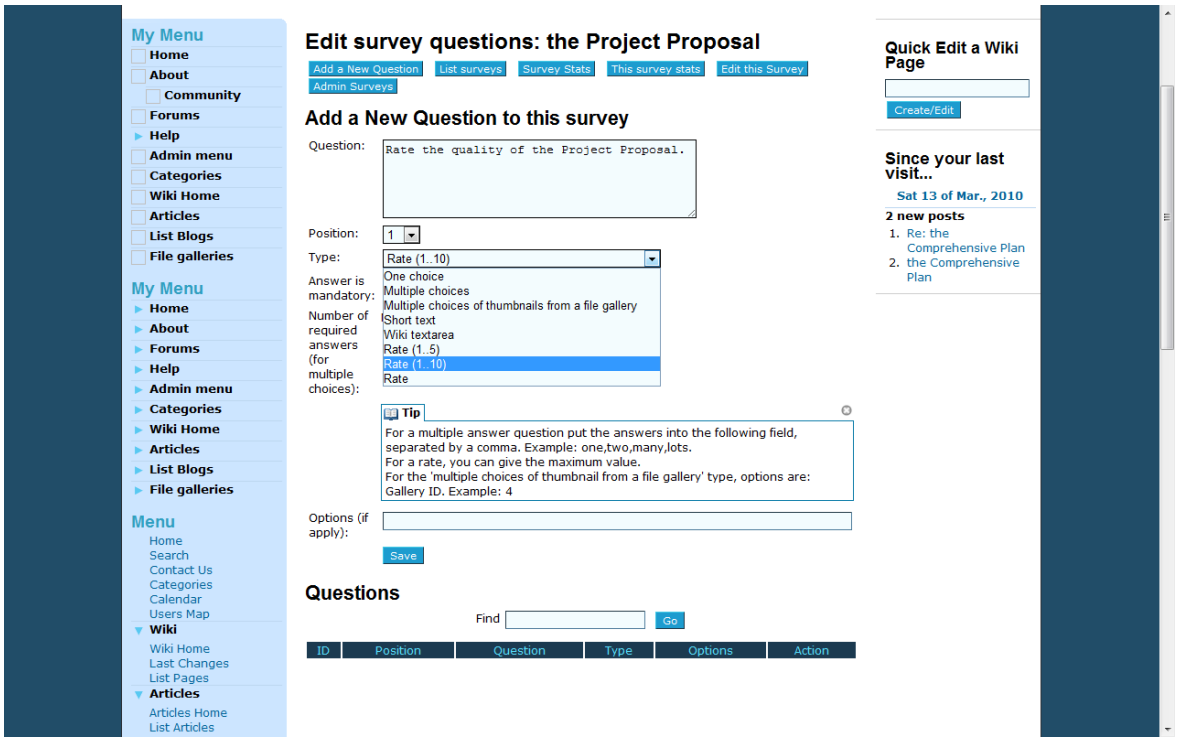

Figure 22: Creating a survey

However, registered users must be able to access the survey from their homepage. In order for this to happen, they must be given a link to the survey in their menu bar on the left. To add this link, the administrator must first click on "Menus" under the Admin toolbar, and then select the desired menu. In addition to a name, the URL must be defined for the link. In this case, the URL was obtained by navigating to the newly created survey, and copying and pasting from the address box in the browser to the My Menu field. "Type" was set to "section level 0" so that it is formatted in the same manner as the other major links in the menu, such as Home, About, etc. In this way, menus can be customized for each user group, and for each stage of the charette. Adding and deleting links as charette

tasks are started and completed can aid in managing control of the entire process, and the content posted on the application by charette participants. This process is shown in Figure 23.

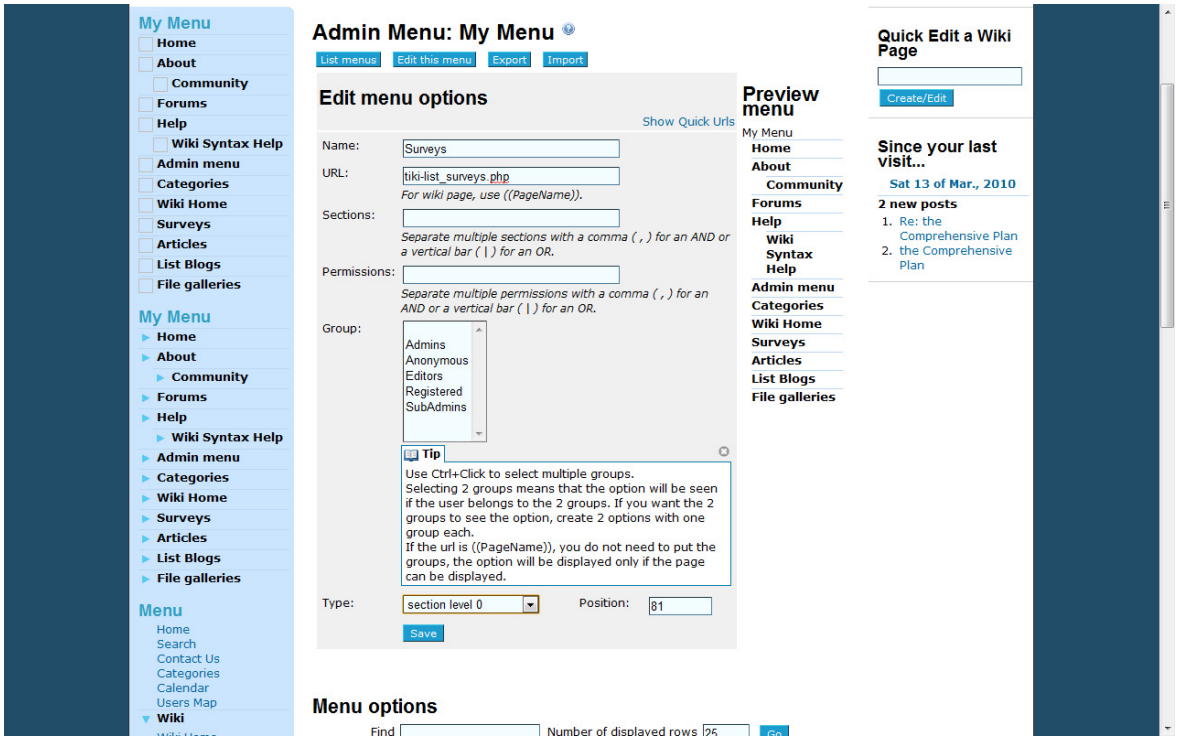

Figure 23: Creating a link in the Menu

Geographic Data Display and Analysis

In addition to the communication tools that have been described thus far, Tikiwiki also offer several means to display data, including photo galleries, Google Maps and Earth, and a GIS map server to display GIS map layers. All data should posted and organized in a way that is understandable to charette participants. The data gathered should include photos of existing conditions, transportation data, market and economic analysis data, local

history, zoning and land use designations of the study area, and other relevant information.

Tikiwiki offers a File Gallery tool that can be used to upload any kind of file, including images. To create a file gallery, the administrator simply clicks "List File Gallery" under the Menu, and then "Create a File Gallery". As usual, permissions should be set so that only the administrator can create and upload file galleries. Once the gallery is created, uploading files is straightforward. Figure 24 shows the menu screen to create the tool.

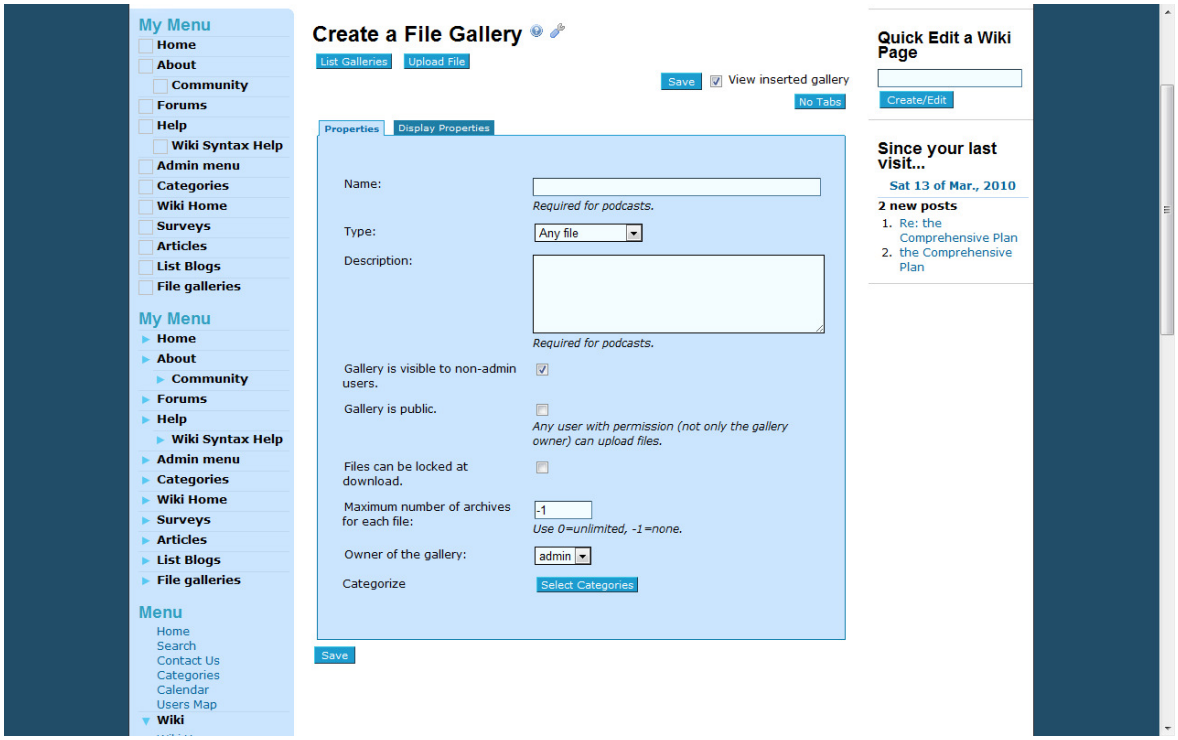

Figure 24: Creating a file gallery

Once the file gallery is clicked on, images are displayed as thumbnails. When clicked on, images are enlarged in the user's window (Figure 25), and can be viewed in sequence, similar to a photo-sharing site like Flickr.

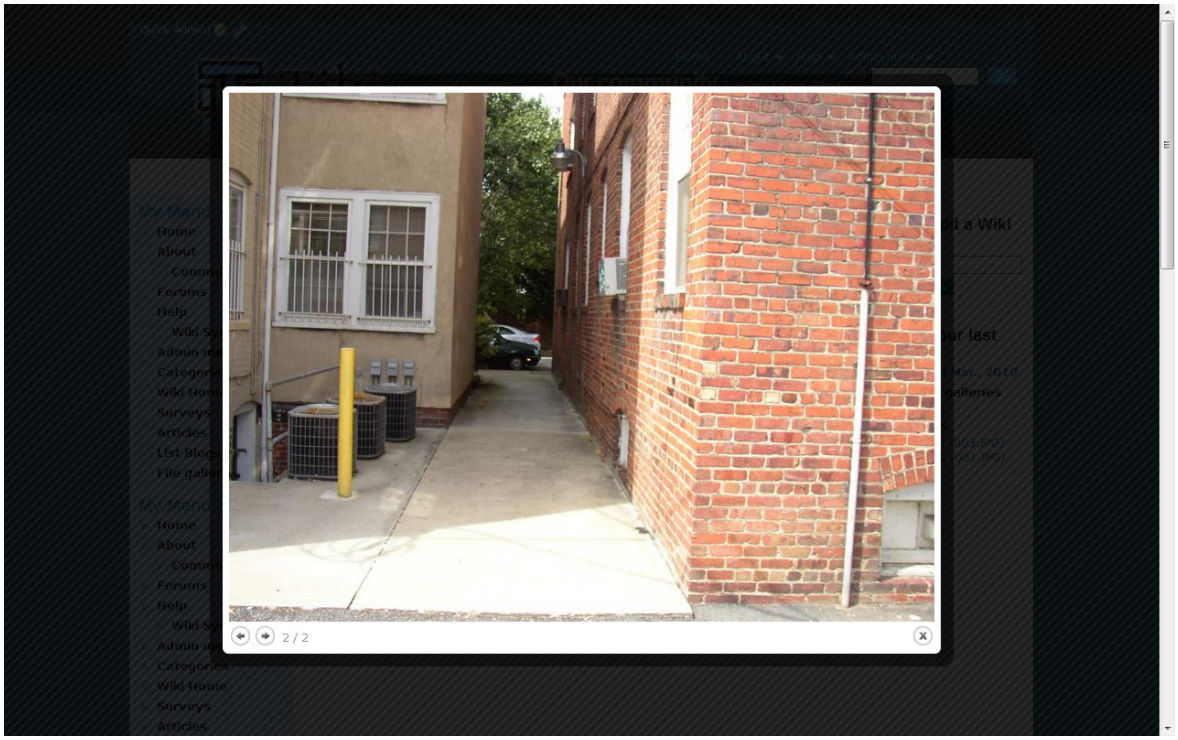

Figure 25: a user's view of a picture file gallery

Tikiwiki also offers several ways to display maps of the study area, via Google Maps and Earth, and an open source GIS tool called MapServer. Any of these could be used to display relevant data, although they vary widely in their difficulty of setup and configuration. Of these tools, the available Google Maps tool is by far the easiest to use. After the administrator has enabled Google Maps and accessed its configuration page via

the Administration panel, he or she must obtain a Google Maps API key by clicking on the given link, and entering it into the correct field, as shown in Figure 26:

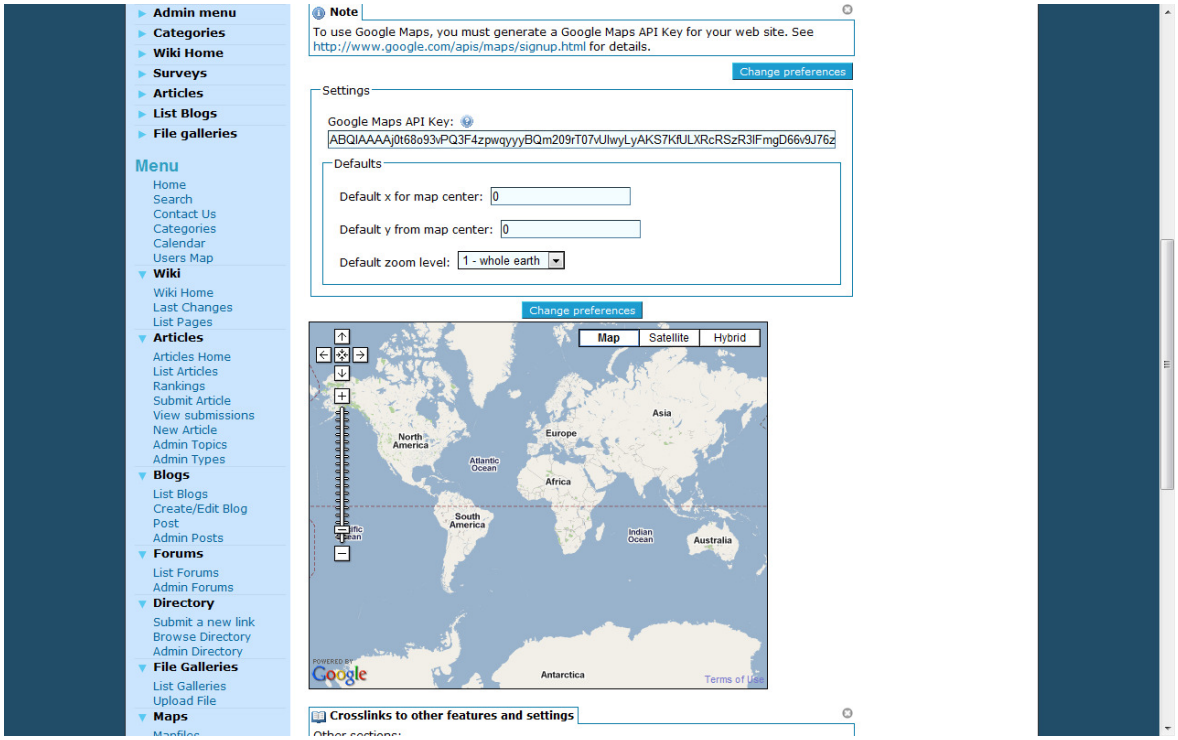

Figure 26: Configuring a Google Map

The next step is to pan and zoom to the desired geographic area. The "Default x for map center" and "Default y from map center" will be filled in automatically. Clicking the "Change Preferences" button will then save the zoom level and area on the map. Here, the map has been zoomed in on the Fan of Richmond Virginia:

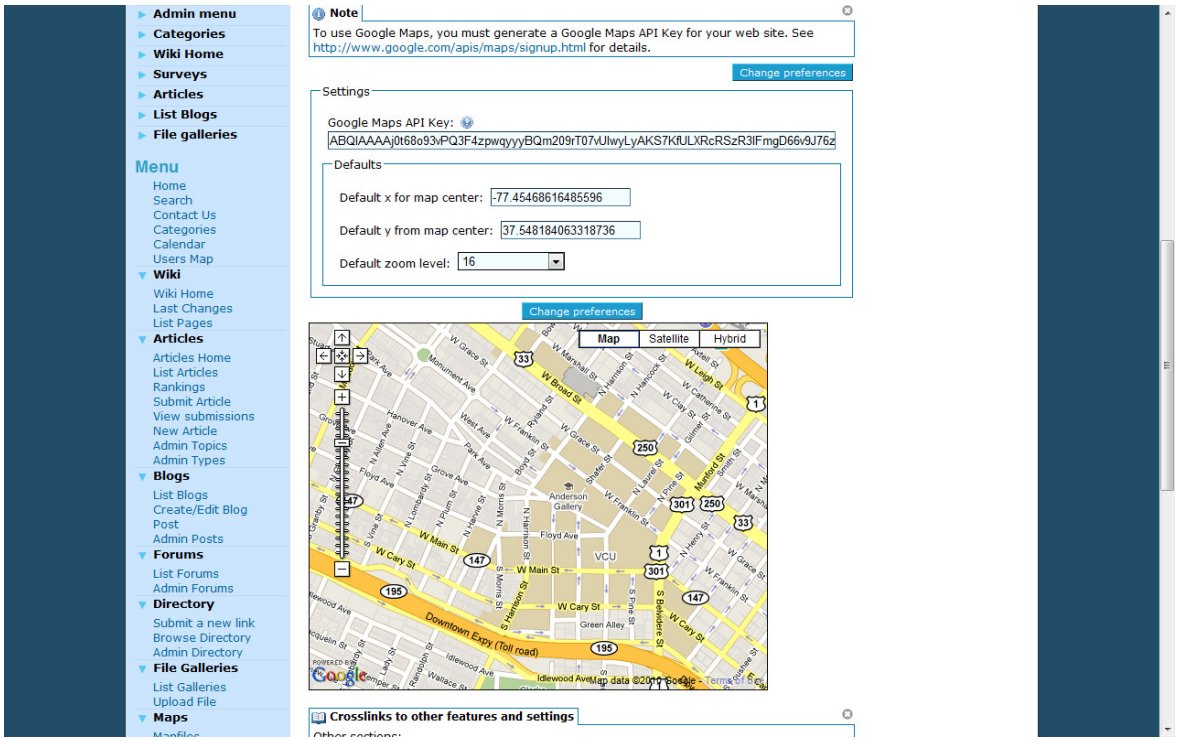

Figure 27: Configuring a Google Map (continued)

The map can then be accessed by clicking on "Users Map" under the Menu. However, as with Surveys, a link must be added to the Registered user menu so that this group of users are able to see the map as well. To add the link, the URL for the Google Map must be copied from where the map is visible (Figure 28):

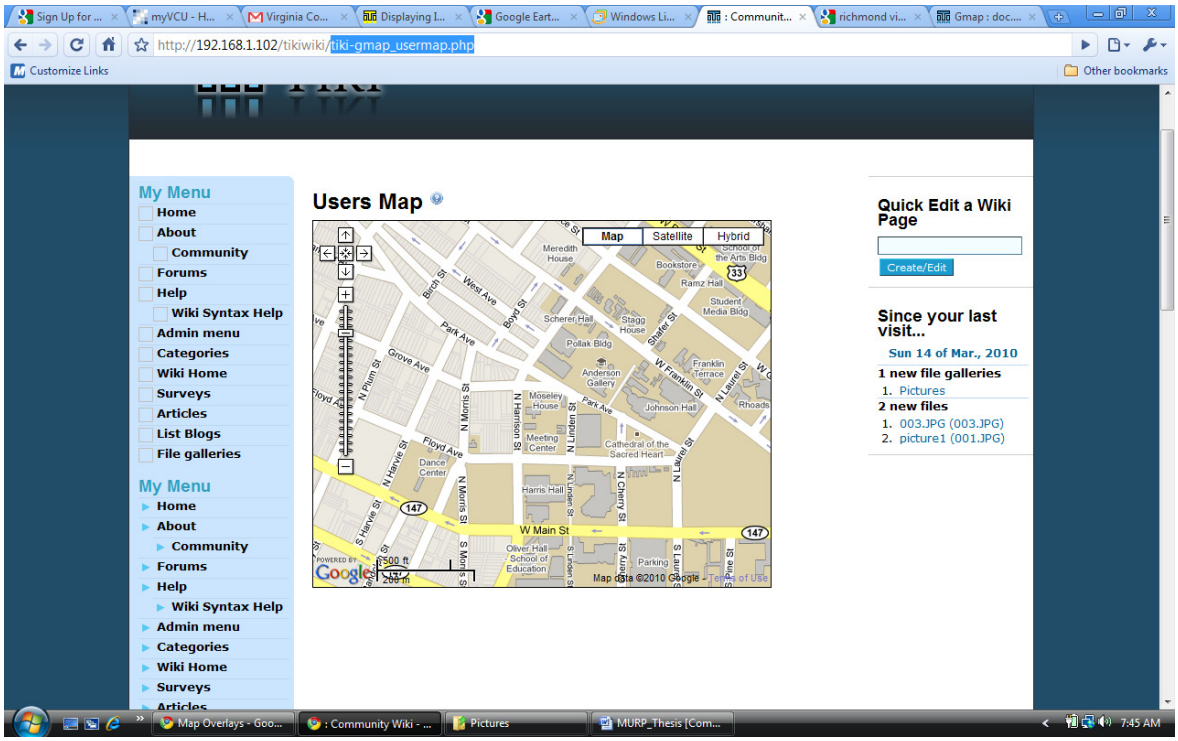

Figure 28: A user's view of the Google Map

In this case, the URL is tiki-gmap_usermap.php. The link can then be generated from the My Menu configuration screen. As displayed in Figure 29, the Google Maps URL is now linked with a link called Google Map:

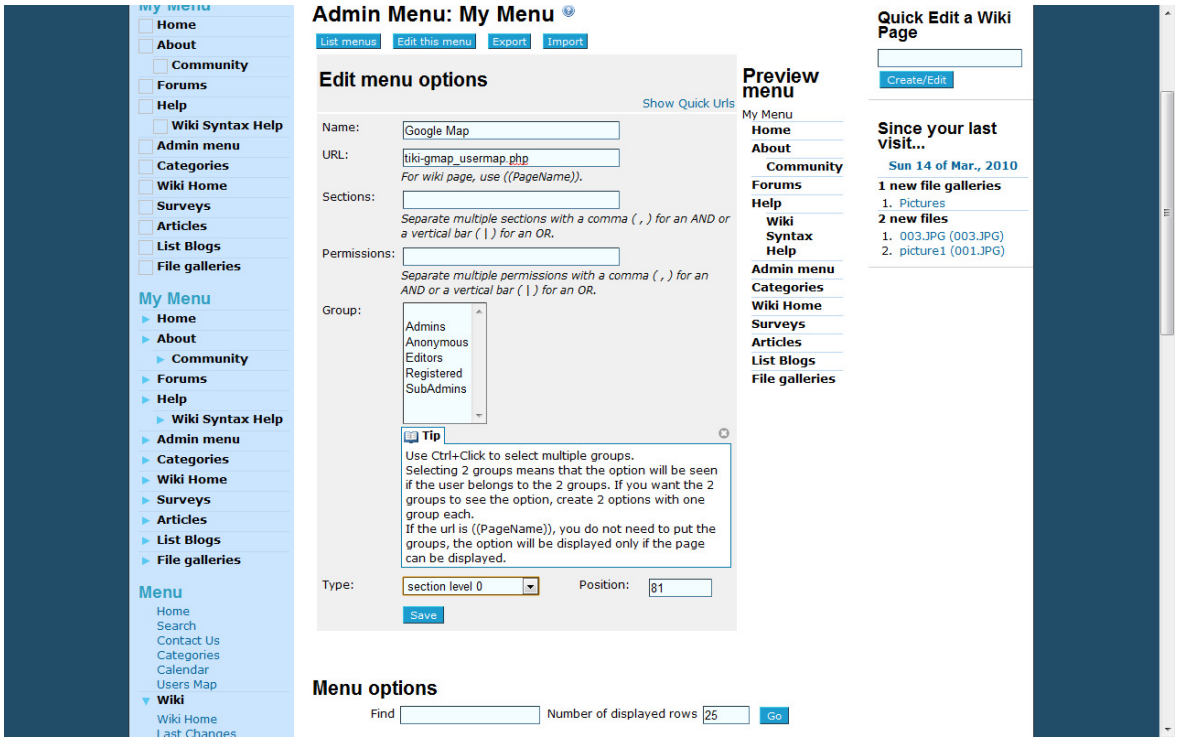

Figure 29: Creating a link to the Google Map

The Google Map is now accessible from the Registered user's homepage, via the newly created link. Normally, Google Maps can be customized with layers, information balloons, photos, and other data, but Tikiwiki's Google Map creation tool does not allow these options. Even so, a simple map like this would be a useful illustration of a study area, and the Wiki page could have other content added to it that would complement the map. For example, the area's history, street-level photos, podcasts, sound files, videos, and other data associated with the area could easily posted alongside it. A user's view of the Google map can seen in Figure 30.

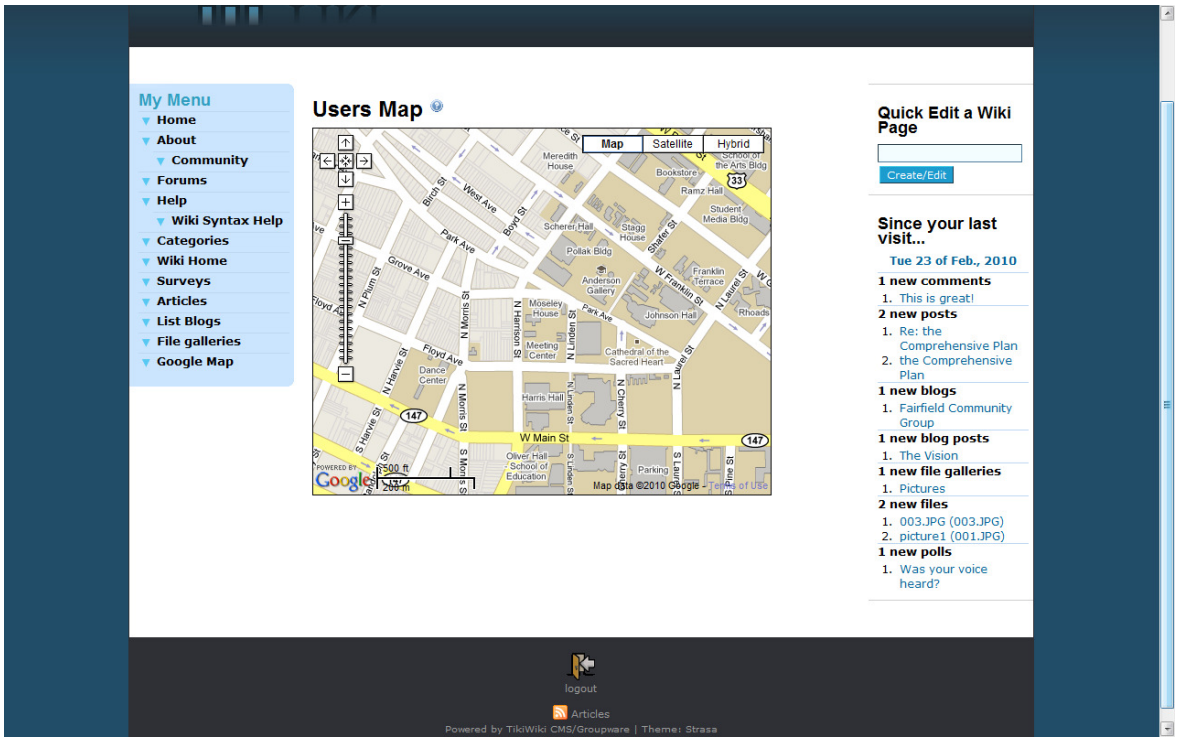

Figure 30: A user's view of the Google map, with the My Menu link

There is, however, an alternative method to adding maps to Tikiwiki pages, one that also allows Google Earth to be embedded and customized. Tikiwiki comes with a variety of so-called "plugins" which can be used to embed wide variety of features common to websites, such as Flash videos, YouTube videos, blog posts, banners, and many different types of other objects anywhere within a wiki page. Tikiwiki's HTML(Hypertext Markup Language) plugin allows a user to embed HTML markup as if the wiki page were a web page, taking advantage of the power that a web markup language can offer. One of HTML's abilities is to embed an "instance" of a Google Map or Google Earth in a web page; the key difference between this method and the standard Tikiwiki

Google Maps tool is that the Google Map or Google Earth instance can be customized further using HTML and Javascript, which along with Cascading Style Sheets (CSS), are the building blocks of most web pages on the Internet. Unfortunately, this kind of customization is well beyond the ability of planners without a computer programming background. Additionally, Tikiwiki does not have the functionality to automatically generate an instance of Google Earth the way it can with a Google Map. However, examples from the Google Code repository have been used to develop a block of HTML and Javascript code that will allow a non-programmer to embed Google Earth in a Wiki page. While this is still a technically complex task for someone with average computer skills, the following procedure will allow a planner to take advantage of Google Earth in ways that typically only web programmers can do. Quickly summarized, the steps are the following:

1. Enable the HTML plugin.
2. Create a new wiki page.
3. Substitute in alternative Google keys and KMZ file names into the code.
4. Copy and paste the provided code with an ANSI text editor.
5. Confirm the changes.

The first step is to enable the HTML plugin feature, which comes disabled by default in every new Tikiwiki installation. First, the administrator should access the Adminstration panel and then select the "Editing and Plugins" button, and then click on the

"plugins" tab. The html plugin can be enabled by checking the "Enable" option and clicking "Change Preferences" at the bottom of the page (Figure 31).

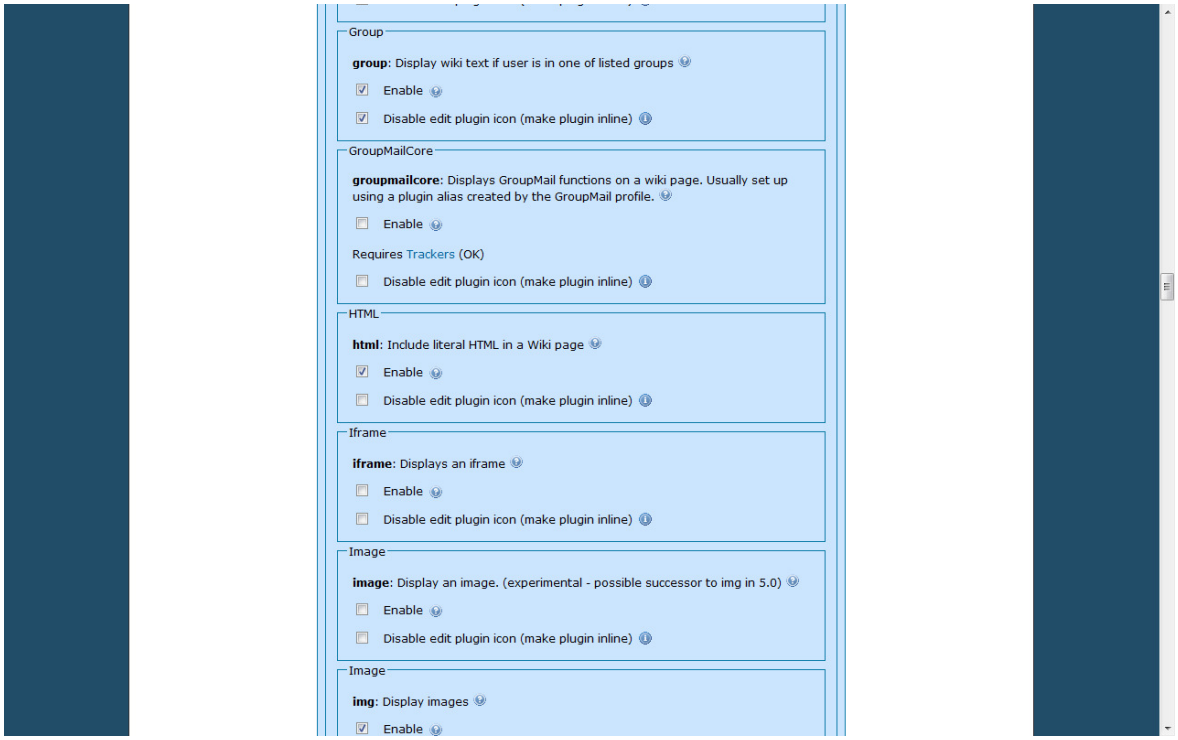
Group
group: Display wiki text if user is in one of listed groups
Enable
Disable edit plugin icon (make plugin inline)
GroupMailCore
groupmailcore: Displays GroupMail functions on a wiki page. Usually set up using a plugin alias created by the GroupMail profile.
Enable
Requires Trackers (OK)
Disable edit plugin icon (make plugin inline)
HTML
html: Include literal HTML in a Wiki page
Enable
Disable edit plugin icon (make plugin inline)
Iframe
iframe: Displays an iframe
Enable
Disable edit plugin icon (make plugin inline)
Image
image: Display an image. (experimental - possible successor to img in 5.0)
Enable
Disable edit plugin icon (make plugin inline)
Image
img: Display images
Enable

Figure 31: Enabling the HTML plugin

The next step is to create a new wiki page by selecting the "Create/Edit" button in the top right hand corner of every Tikiwiki page. Once the new page is created, the administrator will be presented with the screen in Figure 32:

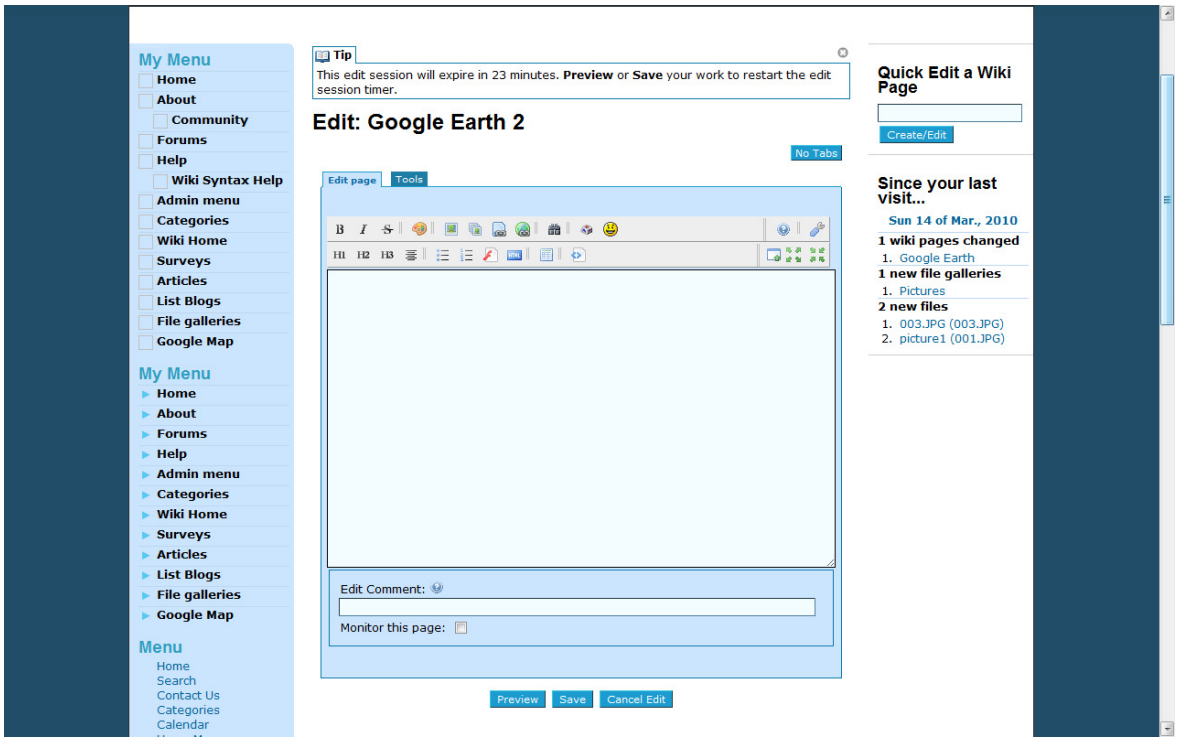

Figure 32: Editing the Wiki page

The user should then copy and paste the following HTML and Javascript code into a text editor such as Notepad, and then into the box shown in the screen above (Users should take note that this code is copyrighted by Google. This author has made some changes to make it compatible with Tikiwiki and to add additional layers.):

Copying the code into a text editor first is very important, because Google Earth will not appear if the code is copied directly from a word processor. Once the code is entered into the text area, the user will be presented with the following screen:

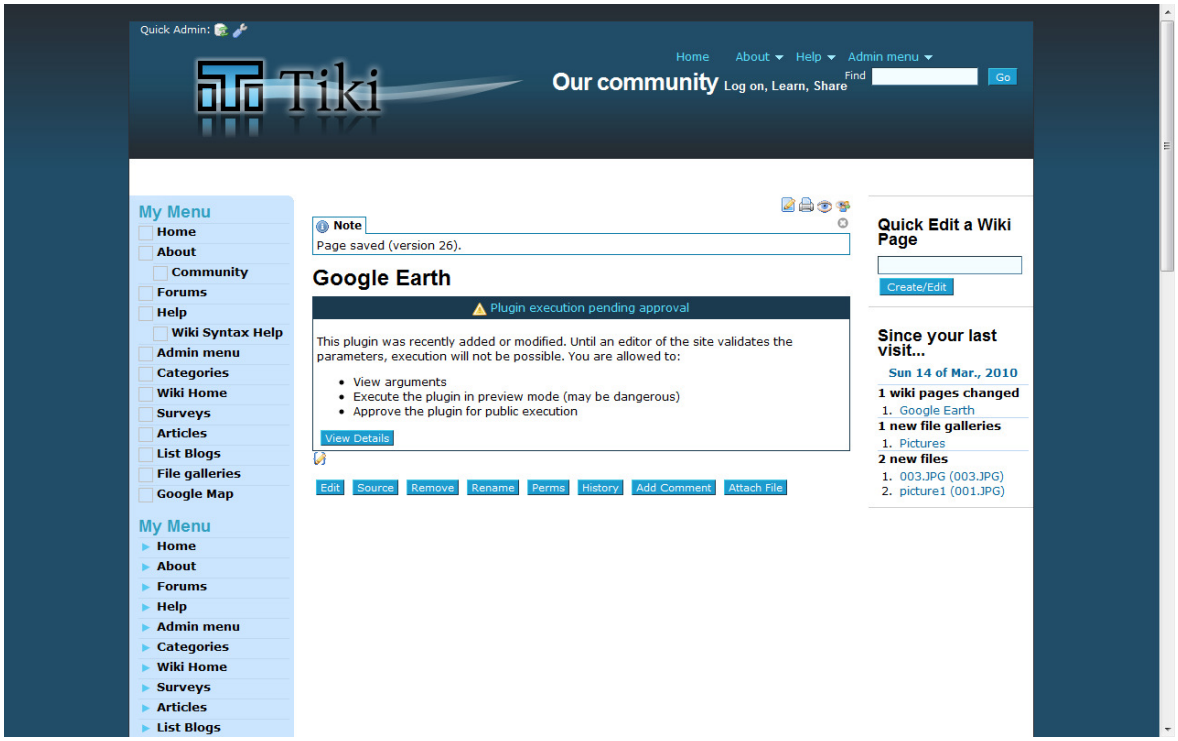

Figure 33: Confirming the changes to the wiki page

This screen is simply a security feature, as Tikiwiki wants to know if the user intended to make the changes. Clicking "View Details" and then "Approve" will confirm the changes, and Google Earth will then appear on the screen (If it does not appear, try refreshing the browser. This is sometimes necessary for the GE window to load properly.):

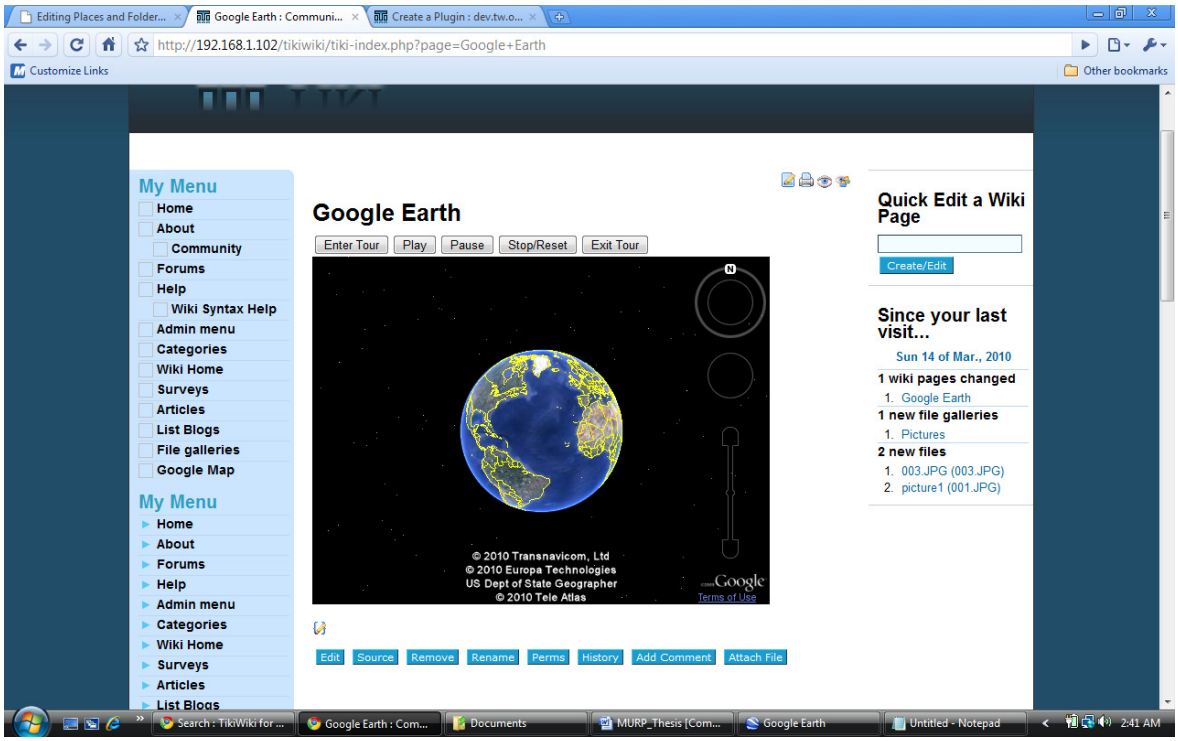

Figure 34: Google Earth, embedded in Tikiwiki

It is not necessary to understand how the code works, but as shown in Figure 34, this instance of Google Earth has the ability to play tours by using the buttons above the window. In this case, the user is given a tour of the Grand Canyon, which is an example developed by Google to show what tours can be used for. The line of code that references the Google Earth Grand Canyon KMZ file is the following:

```
var href = 'http://earth-api-samples.googlecode.com/svn/trunk/examples/' +
    'static/grandcanyon_tour.kmz';
```

The desktop version of Google Earth can be used to create points, lines, polygons, tours, and other features, without the use of any coding, and the resulting "KMZ" file can be exported and viewed in a different copy of Google Earth, including web-based versions like the one shown here. KML (Keyhole Markup Language) is the language that is used by Google Earth and Google Maps to create features such as points, lines, and information bubbles in the map. (More can be learned about KML at http://code.google.com/apis/kml/documentation/kml_tut.html.) A different tour of custom-created features could be substituted into the line of code shown above. In other words, if the Tikiwiki administrator would like to add his or her own KMZ/KML file, the file should be given to the server administrator or hosting service, and the URL and directory path to the file on the server would be substituted for the Grand Canyon .kmz file.

Additionally, the key given in the code here only works for this demonstration copy of Tikiwiki. To add one or more Google Earth or Google Maps instances to a wiki page, the administrator must use the key already obtained for the Google Map created earlier. If a Google Map has not already been created, a key can be obtained here: http://code.google.com/apis/maps/signup.html. The key would then be substituted into the following line of code where <script src="http://www.google.com/jsapi?key= <googlemapkey>:

```
<script
src="http://www.google.com/jsapi?key=ABQIAAAAj0t68o93vPQ3F4zpwqyyyBQm209r
T07vUlwyLyAKS7KfULXRcRSzR3lFmgD66v9J76zvT0uLAshTWQ"></script>
```

If the key given here is not deleted and replaced with a new key, Google Earth will not appear in the page as expected. Additionally it should be noted that one key can be used for multiple instances of Google Earth or Maps, as long as all the instances are placed in the same domain, or in other words, the same copy of Tikiwiki.

A third and final way that geographic data can be displayed in Tikiwiki is the use of the Map Server tool. Unfortunately, the installation and configuration of this tool was found to be so difficult that its practical use is not recommended. Unless the charette team leaders and participants have experience in developing and querying GIS maps of this type, it will be beyond the technical capability of almost everyone involved. In any case, Google Earth and Maps can be configured to feature most of Map Server's functionality, rendering Map Server unnecessary in most production environments.

Web-Based Dynamic Planning: Policy Changes

Because a web-based planning process would constitute a slightly different model, it may be necessary to make changes to state regulations authorizing the creation of comprehensive plans at the local level. For example, although the Virginia state code says what may go into a Plan, it does not say on what medium the Plan may be displayed. The code's prescription for advertisement of planning sessions in newspapers indicates that it needs to be updated to include online media.

Secondly, state code needs to authorize a greater level of transparency, information access, and citizen participation than it currently provides. Without these provisions, local jurisdictions will have no incentive to provide an online medium for dialogue. Additionally, the regulation should take into account the risks associated with an online process, and define a basic set of procedures to avoid the problems discussed earlier. For example, the law could require all participants to post under their real names, to register with the planning team as a precondition of posting, and to require planners to disclose all written communication on the CPSS. While such requirements would no doubt be controversial, they may be necessary to prevent even more controversy that online planning could potentially produce.

Conclusion

Web planning based on a Collaborative Planning Support System is not without its drawbacks and potential risks, but it remains the best hope for forging a truly collaborative planning framework. The affordable, user-friendly communications technology presented here has the potential to benefit urban planners and the communities they serve, in the same manner that technology has improved communications in the private sector. Although the software products evaluated in this research were not a perfect fit for use as CPSS, Tikiwiki is the closest to providing a pre-built application that planners can use for a charette process. However, the lack of a planning-specific CMS suggests that if a robust collaborative planning software package is designed, it could be gradually embraced in the same way that GIS has become accepted as part of planning. The set of standard general requirements and toolkit could serve as a starting point for the development of such a program, and its overall structure could be based on the dynamic planning process workflow. An online toolkit with adaptability and power would complement planners' skills and knowledge as they fulfill collaborative roles communicators and mediators in the planning process.

To realize this goal, further research is needed to be conducted to better identify user requirements, design a structured interactive and collaborative process, develop

implementation strategies for acceptance by planners and interested community participants, and test and validate the resulting system for its effectiveness in facilitating better communication in land use planning sessions.

Development of such a toolkit would be an iterative process, and the resulting model would need to be validated through repeated testing to confirm the model's effectiveness. The determination of user requirements would be a critically important task, given the demonstrated disparity between planners' stated needs and the current state of PSS-related application research and development. Surveys should be conducted to identify planners' and charette participants' interface preferences, tools of choice, and overall accessibility. Prototypes of interfaces could be developed and tested on aesthetic quality, navigability, logical layout, and ease of use. A fully functional prototype could be employed in a real-world collaborative planning context, and measured against a more traditional approach for planning and conducting a charette. These tests should include an assessment of its perceived value and ability to encourage greater levels of participation in local land use decisions, and metrics of public perception of the planners' understanding of their opinions.

These research results could then be used to make model refinements, which would then be redeployed for further testing. Measured over time, the application's usage rate would depend largely on the level of acceptance it achieves among its users, which in turn would determine the extent to which a planning process can be actually be designed around the technology. If the usage rate is low, research should be conducted into why the application is not being used at the rates intended by its designers.

Only further research and testing will provide insight into how successful such an application would be in efficiently facilitating greater levels of citizen input. The Tikiwiki-based system presented in this research, for all of its ability and potential, needs improvement before it could be adopted in most planning scenarios. The first priority for system developers should be to make the application more accessible to non-technical administrators, given the reality that relatively few planners have a technical background. In its current form, Tikiwiki's administration interface and configuration workflows are sometimes unclear, and an inexperienced user is almost totally reliant upon the documentation to perform many configuration tasks. One of the central characteristics of good interface design is that users can intuit the functions of buttons, menus, toolbars, and other objects merely by their appearance, placement, and symbology. Tikiwiki has not reached this standard because it was not originally intended for the use proposed in this research, but its interface would need improvement if it is to be successfully implemented as a planning toolset. In addition to its ease of use, improvements to its aesthetic quality would also be helpful. While the latest versions of Tikiwiki have been greatly improved with the addition of more and more 'skins', additional options for customizing its colors and design would contribute to the likelihood of its acceptance by planners.

The existing toolset could also be improved to enhance its already impressive power and flexibility. Due to its difficulty of installation and use, and its importance to any planning process, the Map Server tool should be included as part of the Tikiwiki package; as of this writing, Tikiwiki 4.0 requires a separately installed and configured copy of Map Server for it to function with Tikiwiki. The Tikiwiki version of the Map Server tool should

also be pre-configured to display GIS datasets common to planning scenarios, such as roads and zoning layers. Additionally, Tikiwiki should be modified to integrate U.S. Census demographic, housing, and economic data for a given study area, and should have the ability to generate choropleth maps displaying market demand for products and services defined by the North American Industry Classification System (NAICS). Drop down menus that give a user the ability to display a wide variety of such thematic maps would be a useful tool for planners and charette participants alike. Likewise, Tikiwiki should be updated so that Google Earth is integrated as a part of the package, just like Google Maps. The user should not have to copy and paste Javascript code as described in the tutorial, but should be able to simply press a button on any Wiki page where a Google Earth window would be useful.

These suggestions' purpose is to improve the technology itself, but should be viewed as the first step toward improving the value of the technology to the planning profession, and therefore the planning profession itself. The problems that hinder the development of a more democratic, efficient, and generally more effective and robust planning process will probably not be solved without the application of tools and methods that have thus far been untested. The current approach toward urban planning practiced in both the public and private spheres is designed and structured around the constraints placed on it by time, funding, geography, and bureaucracy; these constraints however do not necessarily apply in a web-based planning process, and therefore the process itself could be substantially modified to reflect the tools' capabilities. Such modifications are necessary to encourage citizens to think about their communities' status and direction, to consider

approaches for developing healthy growth and improved lifestyles in their communities, and to communicate their contributions to the knowledge base in an efficient manner. The resulting output would hopefully be viable community development strategies that accurately reflect citizens' wishes, rather than plans that merely conform to outdated bureaucratic requirements. In other words, if urban planners' goals include encouraging citizens to participate in land use decision-making, then planners should consider viable, effective strategies for developing communications tools to accomplish their purpose of building more livable communities.

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APPENDIX A

GOOGLE EARTH

```
        {HTML()}
        <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
        <html xmlns="http://www.w3.org/1999/xhtml">
          <head>
            <meta http-equiv="content-type" content="text/html; charset=utf-8"/>
            <title>Google Earth API Sample</title>
            <script
src="http://www.google.com/jsapi?key=ABQIAAAAj0t68o93vPQ3F4zpwqyyyBQm209r
T07vUlwyLyAKS7KfULXRcRSzR3lFmgD66v9J76zvT0uLAshTWQ"></script>

            <!-- We'll need to walk the DOM looking for features of a certain type later -->
            <script src="http://earth-api-
samples.googlecode.com/svn/trunk/lib/kmldomwalk.js" type="text/javascript"></script>

            <script type="text/javascript">
              function addSampleButton(caption, clickHandler) {
                var btn = document.createElement('input');
                btn.type = 'button';
                btn.value = caption;

                if (btn.attachEvent)
                  btn.attachEvent('onclick', clickHandler);
                else
                  btn.addEventListener('click', clickHandler, false);

                // add the button to the Sample UI
                document.getElementById('sample-ui').appendChild(btn);
              }

              function addSampleUIHtml(html) {
```

```
    document.getElementById('sample-ui').innerHTML += html;
  }
</script>
<script type="text/javascript">
var ge;

var tour = null;

google.load("earth", "1");

function init() {
  google.earth.createInstance('map3d', initCallback, failureCallback);

  addSampleButton('Enter Tour', enterTour);
  addSampleButton('Play', playTour);
  addSampleButton('Pause', pauseTour);
  addSampleButton('Stop/Reset', resetTour);
  addSampleButton('Exit Tour', exitTour);
}

function initCallback(instance) {
  ge = instance;
  ge.getWindow().setVisibility(true);

  // add a navigation control
  ge.getNavigationControl().setVisibility(ge.VISIBILITY_AUTO);

  // add some layers
  ge.getLayerRoot().enableLayerById(ge.LAYER_BORDERS, true);
  ge.getLayerRoot().enableLayerById(ge.LAYER_ROADS, true);
  ge.getLayerRoot().enableLayerById(ge.LAYER_BUILDINGS, true);
ge.getLayerRoot().enableLayerById(ge.LAYER_TERRAIN, true);

  // create the tour by fetching it out of a KML file
  var href = 'http://earth-api-samples.googlecode.com/svn/trunk/examples/' +
             'static/grandcanyon_tour.kmz';

  google.earth.fetchKml(ge, href, function(kmlObject) {
    if (!kmlObject) {
      // wrap alerts in API callbacks and event handlers
      // in a setTimeout to prevent deadlock in some browsers
      setTimeout(function() {
        alert('Bad or null KML.');
```

```
      }, 0);
      return;
    }

    // Show the entire KML file in the plugin.
    ge.getFeatures().appendChild(kmlObject);

    // Walk the DOM looking for a KmlTour
    walkKmlDom(kmlObject, function() {
      if (this.getType() == 'KmlTour') {
        tour = this;
        return false; // stop the DOM walk here.
      }
    });
  });

  document.getElementById('installed-plugin-version').innerHTML =
    ge.getPluginVersion().toString();
}

function failureCallback(errorCode) {
}

function enterTour() {
  if (!tour) {
    alert('No tour found!');
    return;
  }

  ge.getTourPlayer().setTour(tour);
}

function playTour() {
  ge.getTourPlayer().play();
}

function pauseTour() {
  ge.getTourPlayer().pause();
}

function resetTour() {
  ge.getTourPlayer().reset();
}
```

```
            function exitTour() {
              // just like setBalloon(null)
              ge.getTourPlayer().setTour(null);
            }

            </script>
          </head>
          <body onload="init()" style="font-family: arial, sans-serif; font-size: 13px;
border: 0;">
            <div id="sample-ui"></div>
            <div id="map3d" style="width: 500px; height: 380px;"></div>
            <br>

          </body>
        </html>
{HTML}
```

VITA

Craig MacIvor was born December 17th, 1982 in Richmond Virginia, and earned his B.A. from Furman University in 2005. He currently resides in Richmond will receive his Master of Urban and Regional Planning (M.U.R.P) degree from Virginia Commonwealth University in the spring of 2010.